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CAROL JOY HOBSON AND SAMUEL SCHLOSS

Mathematics and Science Teachers in U.S. Schools
KENNETH BROWN AND ELLSWORTH S. OBOURN

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Investment in youth

First, we need to strengthen our Nation by investing in our youth:

The future of any country which is dependent on the will and wisdom of its citizens is damaged, and irreparably damaged, whenever any of its children are not educated to the fullest extent of his capacity, from grade school through graduate school. Today, an estimated 4 out of every 10 students in the fifth grade will never finish high school—and that is a waste we cannot afford.

In addition, there is no reason why 1 million young Americans, out of school and out of work, should all remain unwanted and often untrained on our city streets when their energies can be put to good use.

Finally, the oversea success of our Peace Corps volunteers, most of them young men and women carrying skills and ideals to needy people, suggests the merit of a similar corps serving our own community needs: in mental hospitals, on Indian reservations, in centers for the aged or for young delinquents, in schools for the illiterate or the handicapped. As the idealism of our youth has served world peace so can it serve the domestic tranquility.

* * * * *

Finally, and of deep concern, I believe that the abandonment of the mentally ill and the mentally retarded to the grim mercy of custodial institutions too often inflicts on them and their families a needless cruelty which this Nation should not endure. The incidence of mental retardation in the United States of America is three times as high as that of Sweden, for example—and that figure can and must be reduced.

—From President Kennedy's State of the Union Address.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE • ANTHONY J. CELEBREZZE, *Secretary*
OFFICE OF EDUCATION . . . FRANCIS KEPPEL, *Commissioner*
B. HAROLD WILLIAMS, *Acting Director, Office of Information*

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Notes on the Notable

FEDERAL PROGRAMS AND ACTIVITIES

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Educational media center

THE EDUCATIONAL MEDIA Demonstration Center established last year in the Office of Education provides a central source of information on all kinds of media and equipment. James J. McPherson of the Educational Media Branch directs the center.

It is the purpose of the center, Dr. McPherson says, to exhibit audiovisual media and equipment and show how they can be used advantageously in education; to assist staff members in preparing and using the new media; to report the findings and uses of research and the uses by educational institutions; and to relate developments in educational media to curriculum planning, school organization, and school facilities. In addition, the center will serve offices and conference rooms in the building by making equipment and operators available and by distributing televised events and material over its closed-circuit television system.

The center's staff will supervise the production and distribution of films, video tapes, and other audiovisual materials for Office use in reporting to the public on developments in education, national needs, and Office programs to meet these needs.

Two exhibits have already been held in the center: The first, October 22–26, on teaching machines and programed instruction; and the second, December 24–30, on Office programs dealing with new methods of teaching foreign languages.

Other events have been planned, and dates have been set for two. On February 5–6, James B. Finn will report on a 2-year study of the effects of present and predicted developments in communications technology on education. Dr. Finn is professor of education, University of Southern California, and director of this study, which is being supported by the Office of Education under title VII of NDEA. On February 20–22, the Secondary Schools Section and the Demonstration Center will cooperatively present an exhibit and a series of briefings on recent developments in teaching secondary science.

Up-to-the-minute data on teachers

THE BUDGET BUREAU last month approved the first step of a pilot project that will enable the Office of Education to find out whether, within a single school year, it can not only collect the current data on the Nation's public schools but also tabulate it and make it available for use.

The project will concentrate on teachers. The Office has sent a questionnaire to all the States to learn which ones have, in machine-usable form (on punch cards), data on 12 basic items for each certified teacher—items such as age, sex, salary, degrees, and status of the teacher, that is, full time or part time. It is also asking States that do have such data to send sample copies of their cards, codes, and definitions. Dr. Mapheus Smith, acting director of OE's statistics division, says that the States will problably respond before the end of this month.

If, upon analysis of these materials, the Office finds that the data from the several States are compatible and that it is feasible to obtain decks of cards for central tabulation, it will request them from the States. The decks will be fed into the machines of the Department of Health, Education, and Welfare—to produce totals for each State and for the Nation; they will be used to relate various factors—for instance, age to salary, salary to education, and salary to instructional level.

What makes the project possible is the fact that nearly all the States now have punch-card systems, as a result of assistance provided under title X of the National Defense Education Act. If the pilot project is successful, it will mark the beginning of a new era in the gathering and using of data from the public schools.

Three panels to review proposals for OE research council

NEXT MONTH in Chicago, just before the national meeting of the American Educational Research Association, three ad hoc panels will meet to review certain proposals made to the Office of Education under its Cooperative Research Program. The proposals have come from colleges, universities, and State departments of education.

One panel will review proposals for the establishment of curriculum study centers in social studies; another, proposals for demonstration projects in the education of the talented; and the third, proposals for demonstration projects *and* curriculum study centers in the teaching of English.

Plans call for all three panels to meet on February 12. Later the same day their recommendations will be reviewed at a meeting of the Cooperative Research Program's advisory council.

Language institutes for elementary and secondary school teachers

ABOUT 4,520 teachers of foreign languages in public and private elementary and secondary schools will have an opportunity to take special training at Government expense at 83 language institutes in the summer of 1963 and academic year 1963–64.

Seventy-nine colleges and universities under contract with the Office of Education will conduct the summer institutes for 4,423 teachers, including 3,521 secondary and 902 elementary school teachers. Four colleges and universities will conduct the academic year institutes for 97 teachers, including 77 secondary and 20 elementary school teachers.

The Office has allocated approximately $7.2 million to cover the cost of stipends and allowances for teachers and operating expenses for the colleges and universities conducting institutes.

Lists of the colleges and universities and the languages to be offered are available from the Office of Education.

OE grant for language study

THE Office of Education is supporting a project which it hopes will encourage many of the New Englanders who speak Canadian-French to become teachers of French.

With a $12,000 grant from the Office (NDEA, title VI), Bowdoin College, Brunswick, Maine, will develop a textbook and tape recordings adapted to translating Canadian French into standard French. These teaching materials will be used in language classrooms in New England, primarily in Maine, New Hampshire, and Massachusetts, where most of the 1½ million Americans who speak Canadian-French live.

Gerard Brault, associate professor of romance languages and vice dean of the Graduate School of Arts and Sciences, University of Pennsylvania, will direct the project. Dr. Brault was formerly on the Bowdoin faculty.

Language and area centers: Summer programs

IN THE SUMMER of 1963, 20 language and area centers in colleges and universities will offer intensive instruction in about 26 critically needed languages. The centers will match approximately $200,000 in NDEA (title VI) funds used to support these programs.

The programs are distributed by world areas: 7 programs are in Far Eastern languages; 4 in Slavic; and 2 each in African, Middle Eastern, South Asian, and Southeast Asian languages; and 1 in Portuguese.

The students in these programs will receive instruction equivalent to a full year's course work in language. Most of them will be graduate students, but some will be undergraduates studying under special fellowships.

Because the demand for persons who have studied these languages as graduates or undergraduates so far exceeds the supply, the Office of Education has established a pilot program of 100 awards to undergraduates for study of 18 languages in 13 summer programs.

The Office will announce the names of undergraduate fellows and alternates around April 1, 1963. Regular grants and awards made under the NDEA language and area center program and the language fellowship program will also be announced this spring.

Guidance and counseling institutes scheduled

THE Office of Education has earmarked about $7.2 million of NDEA (title V–B) funds for 76 counseling and guidance institutes to be conducted by colleges and universities in the 1963–64 academic year and 1963 summer sessions. All of these institutes are for counselors in secondary schools or teachers preparing to become counselors.

Twenty-three institutes will be held in regular sessions and will enroll about 685 counselors for a full year of training. The other 53 institutes will be conducted in the summer sessions and will enroll nearly 1,600 counselors who have already had some training in their field.

Since the institutes program was begun in 1959, approximately 11,500 counselors or teachers have been trained in 275 summer and 65 regular session institutes.

Approximately 60 percent of the Federal funds are used for stipends and allowances for counselors and the rest for operation of the institutes.

Lists of the colleges and universities conducting the institutes are available from the Office of Education.

Graduate fellowship programs

THE OFFICE of Education has approved 623 graduate fellowship programs at 155 colleges and universities for the academic year 1963–64. By April 15, 1963, a total of 1,500 graduate fellowships will have been awarded in these programs. Two of the fellowships will go to the University of Alaska; Alaska is in the program this year for the first time, and all 50 States and the District of Columbia will be participating.

The programs are distributed among six academic fields: Humanities, 21 percent; education, 10 percent; social sciences, 24 percent; biological sciences, 18 percent; physical sciences and mathematics, 16 percent; and engineering, 11 percent.

Funds for these programs are authorized under the National Defense Education Act, title VI, to increase the number of well-trained college and university teachers by providing fellowships for able students preparing to become teachers and by assisting the graduate programs in which the fellows are studying. Fellows receive stipends of $2,000 in the first year, $2,200 in the second, and $2,400 in the third and an allowance of $400 for each dependent. Graduate schools receive payments of up to $2,500 for each fellow they enroll in an approved program.

When the 1,500 fellows selected this spring enter school in the fall, about $38.8 millions in Federal funds will have been paid or obligated to graduate schools for the training of 7,000 fellows since the beginning of the program in the 1959–60 academic year.

Lists of the approved programs are available from the Office of Education.

Repeal of affidavit requirement stimulates student loan program

SEVENTEEN additional colleges and universities are participating in the student loan program (NDEA, title II) as a result of congressional repeal of the requirement that applicants for loans file noncommunist disclaimer affidavits. All 17 institutions had filed provisional applications for funds last spring, stipulating that their participation would depend on the repeal.

Under the new law (Public Law 87-835) all applicants for a loan or a fellowship or individual payment under the National Defense Education Act of

1958 and the National Science Foundation Act of 1950 are required to take the oath of allegiance. Applicants for fellowships must disclose any criminal convictions or criminal charges pending against them. The law fixes a penalty for a member of a subversive organization who applies for or uses funds provided under these two laws.

Progress in counseling and guidance

SCHOOL counseling and guidance has grown in stature as a profession and in services to schoolchildren in the last few years. This growth has been stimulated by public recognition of the need for and value of counseling and guidance and by support from Federal and State governments, local school systems, colleges and universities, and professional associations. For example, look at these facts:

- State legislatures and departments of education have raised their certification requirements for counselors in public schools. (Details on State requirements are reported in *Guidance Workers Certification Requirements*, by Dolph Camp, now in press.)
- Colleges and universities have upgraded their counselor education programs or initiated new programs.
- The findings of research have contributed new knowledge of techniques to counselors and other guidance workers and given them new insight into children's problems.
- Special institutes supported by NDEA have provided training for about 11,500 high school counselors or teachers preparing to become counselors.
- At the end of fiscal year 1962 local schools were employing the equivalent of 24,500 full-time counselors, an increase of 12,500 over the 1958 total.
- Under NDEA, scholastic aptitude and ability testing has been made available to nearly 80 percent of all secondary school pupils.

These accomplishments mean that many schoolchildren have a better chance to succeed than the average had just 10 years ago. But as impressive as the gains are, they do not guarantee that every counseling and guidance program is as good as it might be, for even a program amply financed and directed by a well-trained counselor may be no more than mediocre if the school administrator does not accept responsibility for it.

Fred F. Beach, director, Office of Education's branch on administration of State and local school systems, and the award he received from the Council of Chief State School Officers at its annual meeting, Miami Beach, November 22. The award recognizes Dr. Beach's "dedicated service to education as secretary of the Study Commission of the Council," but he feels that it also honors the Office of Education, which in the 20 years since the Commission was established has assigned many members of its professional staff to cooperate with the Commission in its work of drafting, for the Council, policy statements on crucial issues in American education.

What are an administrator's responsibilities for the program? School board members and administrators themselves have been asking this question. The Counseling and Guidance Branch of the Office of Education is now preparing a publication which should give them some wise and practical answers to their question. The publication, *Responsibilities of School Administrators in Providing Guidance Services in Public Schools*, reports a study made by Donald G. Emery, superintendent of schools, Shaker Heights, Ohio, under contract with the Office. To supplement his own information, Dr. Emery went to school administrators known to be conducting successful programs, to experienced counselors, and to the current literature on the subject.

A preliminary draft of the study was reviewed, paragraph by paragraph, and revised in a conference held in the Office, December 12–14, 1962, and called by Frank L. Sievers, director of the Counseling and Guidance Branch. To work with his staff and Dr. Emery on the review, Dr. Sievers invited these superintendents and counselors to the conference: Steven N. Watkins, superintendent of schools, Lincoln, Nebr.; T. C. Bird, superintendent of schools, Boise, Idaho; E. C. Stimbert, superintendent of schools, Memphis, Tenn.; Noble J. Gividen, superintendent of schools, Bedford Hills, N.Y.; Emeliza Swain, counselor educator, University of Georgia, Athens; Bruce Shertzer, counselor educator, Purdue University, Lafayette, Ind.; Juanita Poretz, counselor, Peary High School, Rockville, Md.; William Gillespie, counselor, Broome Jr. High School, Rockville, Md.; Kathryn Cook, supervisor of guidance, Arlington County, Va.; and Evelyn Wilson, counselor, Wakefield High School, Arlington County, Va. Dolph Camp, specialist in program organization in the Counseling and Guidance Branch, served as conference chairman.

The new publication will add one more item to the list of recent accomplishments in school counseling and guidance. (Watch *School Life* Publications Checklist for release date.)

MALCOLM J. NORWOOD

New horizons for the deaf

FOR THE NATION'S 250,000 deaf citizens the biggest and most hopeful news to come out of the last session of Congress was the enactment of Public Law 87–715, an amendment to the Captioned Films for the Deaf program. The original law (Public Law 85–905) authorizes a loan service of captioned films to help the deaf overcome their social and cultural isolation. The law permits the Office of Education to acquire, caption, and distribute motion pictures through State agencies for showing to groups of eight or more deaf persons. Public Law 87–715 broadens the scope of the original law by authorizing the production and distribution of specialized educational and training films for the deaf and the training of persons in the use of these films. It also permits research into the use of films for the deaf and raises the annual budget ceiling from $250,000 to $1.5 million.

To appreciate the significance of this new act it is necessary to understand the impact of deafness on the individual and the difficulties he encounters. The deaf person is deprived of nearly all sound and, in effect, is shut off from a most important part of his environment. He lives in a world devoid of oral communication, the lifeblood of learning. Virtually all other handicapped persons learn to communicate through hearing, but the deaf person, limited to what he can see, is at a distinct disadvantage in acquiring language.

Public Law 87–715 is a great forward step for the education of the deaf because it provides the facilities for the preparation and distribution of good educational materials with a strong emphasis on visual learning. Captioned films can offer experiences with people, places, and events important to the development of language and ideas. As they provide the deaf child with means of developing language and experience, it is anticipated they will produce growth in both receptive and expressive language and will lead to the ultimate success of the learning pattern.

Though the learning experiences of the deaf are almost entirely visual, little has been done to develop special visual aids. A single school or State does not have the money or the staff for the development of specialized materials for the training of personnel in their use. Personnel to be trained include not only teachers, but also social workers, vocational rehabilitation officers, psychologists, audiologists, and others who work with the deaf of all ages.

Much of the research relating to the deaf is clinical or esoteric: little has been done in the way of practical studies and investigations that will place new tools in the hands of those working with the deaf so that they may do a better job. The research provisions of Public Law 87–715 are aimed primarily at the activation of developmental projects which will permit studies into the uses of television (open and closed circuit), teaching machines and programed learning, special films for the stimulation of speech, job orientation and training films, and other visual tools to facilitate learning.

The expanded Captioned Films for the Deaf program holds promise for the deaf child, the deaf adult, and the parents of deaf children.

The average hearing child enters school with a vocabulary of several thousand words, but the average deaf child of the same age may have no vocabulary at all. The hearing child—with a large background of experiences gained from the constant bombardment of the ears with language—begins to broaden his background quickly by associating the words he knows with their printed symbols. The deaf child must start at the beginning to acquire inner language by associating his experiences with verbal symbols. He must, as it were, relive the years of infancy and early childhood.

The expanded program holds much promise for the adult deaf. The advent of automation in industry is causing grave concern to educators of the deaf and to the deaf themselves. Prosperity on the one hand linked with unemployment on the other, as the trend to automation spreads, is causing a reduction in the number of blue-collar workers and layoffs among the unskilled and semi-

Mr. Norwood has served as program specialist for the Captioned Films for the Deaf program in the Office of Education since December 1960. A graduate of Gallaudet College, he has taught the deaf in his native State of Connecticut and in Texas and West Virginia. Before his appointment to the Office he was supervising teacher of the intermediate and advanced departments of the West Virginia School for the Deaf. Mr. Norwood has been deaf since childhood.

skilled. The deaf worker will probably be among the first to be hit by this phenomenon and provisions must be made for retraining him. Specially prepared captioned films for the use of training and vocational rehabilitation centers will do much to provide an effective means of overcoming this growing problem. In addition, such films will be of use to schools for the deaf for prevocational training before the deaf person enters the labor market.

The parents of a deaf child often find themselves in a huge vacuum. They have no understanding of the problem or of the capabilities of the child. Many of them look upon deafness as a personal stigma. Visual materials developed through Public Law 87–715 can do much to educate the parents to the fact that the deaf child is simply a child who does not hear, not a monstrosity. Such materials will help the parents to gain an understanding and mature acceptance of deafness and to acquire an intelligent way of coping with the problems it brings to the family. They can awaken mothers and fathers of deaf children to the necessity of directing the child's attention to his environment and the events around him. Their interest, in turn, will encourage the child to participate in life, and his participation will stimulate his curiosity, imagination and thinking.

In the 3 short years this program has functioned, its acceptance has been beyond expectations. The enthusiastic response to the service has proved its worth. Congress, in enacting Public Law 87–715, makes it possible for the deaf person to envision new horizons and provides him with better opportunities to take his rightful place as a first-class citizen of these United States.

SCHOOL BONDS—

Sales, Interest Rates, et cetera

A monthly report by ELMER C. DEERING, *Office of Education specialist on the financing of school facilities.*

JUDGING BY THE RECORD of the past 3 months, school bond issues are faring better at the polls this school year than they did last year. In November 1962, voters approved 73 percent of the amounts submitted; in October, 81 percent; and in September, 74 percent; in all these months they went well above the average for the year preceding, which was only 69 percent.

BUT NOVEMBER seems to be losing popularity as a month to hold school bond elections in. For the 5-year period 1957–61 an average of 26.5 percent of all school bonds voted on were voted on in November (*School Life*, November–December 1962), but in both 1961 and 1962 November fell far below that average: in 1961 it had only 12 percent of the total submitted; in 1962, only 16 percent. The 1962 figure is an estimate; it is based on returns received by mid-December, which indicate that close to $2.3 billion in school bonds was submitted during the year as a whole and $373 million in November (31 States had reported 251 school bond elections in that month).

OF THE SCHOOL BOND elections reported for November, 167 were held at the time of the general election, on November 6. These totaled $288 million and were held in 24 States; Ohio, where 99 issues totaling $159 million were submitted, accounted for more than half. On the basis of dollar amounts approved that day in relation to amounts voted on, a dozen States exceeded the national average: Connecticut, Maryland, Montana, North Carolina, Pennsylvania, Rhode Island, and Vermont, all of which approved 100 percent of the amounts submitted; Alaska, which approved 88 percent; Ohio, 84 percent; Michigan, 79 percent; and Texas and Virginia, each 78 percent.

THE INTEREST COST of school bonds declined in November 1962 for the fourth consecutive month. The net average for that month was 2.89 percent, the lowest point since May 1958, when it was 2.75 percent. In December, however, the downward trend was reversed when the average rose to 3.06.

Average net interest cost of Moody-rated bonds sold on the primary market for public school purposes, January 1962–January 1963, by rating

Period	Aaa	Aa	A	Baa	Ba	All rated bonds
1959–60	3.26	3.63	3.77	4.21	4.55	3.84
1960–61	2.82	3.34	3.43	3.75	3.97	3.48
1961–62	2.84	3.23	3.19	3.52	3.93	3.27
1962						
January	3.02	3.13	3.21	3.54	.....	3.23
February	2.75	3.00	3.14	3.39	3.93	3.13
March	2.80	2.99	3.07	3.34	3.89	3.20
April	2.56	2.84	2.85	3.35	3.61	2.94
May	2.56	2.95	3.03	3.34	3.80	3.13
June	2.82	2.83	3.14	3.48	3.93	3.21
July	.....	3.15	3.14	3.61	4.02	3.22
August	.....	3.02	3.08	3.43	3.82	3.17
September	2.83	2.80	3.07	3.47	3.75	3.10
October	.....	2.75	2.96	3.15	3.84	3.01
November	2.38	2.73	2.89	3.15	3.22	2.89
December	2.56	2.73	2.99	3.27	3.86	3.06
1963						
January	2.53	2.79	3.00	3.27	3.78	3.02

Source: Sales reported by the Investment Bankers Association and The Daily Bond Buyer, which include 75–80 percent of the total for public school purposes.

WARREN G. CUTTS

Phonics in beginning reading

OF ALL the controversial issues in the teaching of reading none has aroused more heated debate than phonics. Friendly and unfriendly critics of the schools, teachers, administrators, school board members, and numerous others have all joined in the controversy. Parents, eager for a solution to perplexing reading problems, have reached for phonics as the answer.

Many of these persons, forgetting that in every generation some pupils have had difficulty with reading, earnestly believe that the only thing necessary to overcome today's reading problems is to teach children phonics—that is, to teach them how to sound out their words. And it is true that phonics is one of the essential skills in learning to read, for phonics is the visual representation of spoken language or the speech sounds found in various letters or clusters of letters in written words. By studying phonics, the pupil learns to identify written words with words he knows by sound.

There is no question about the value of phonics in unlocking words for children—this has been conclusively established and accepted by most teachers. But since phonics is only one of the methods of teaching reading, there are questions about when and how it should be taught. Should it be taught as a system of beginning reading? incidentally? in isolation? or as part of the whole reading program? On these questions, opinions differ and instructional practices vary. I believe, however, that phonics should be taught directly and systematically as well as incidentally. However, I am convinced, as are many others, that children find it easier to learn to read and to acquire lifelong reading habits when they enjoy reading from the very beginning. If this is true, phonic instruction should be blended skillfully into a well-rounded reading program in which a variety of methods and instructional materials are used.

Children learn to read most easily when the written words most nearly represent their spoken language. That is why the teacher of reading should direct attention to units of words and combinations of words that mean something to pupils. As soon as possible she should help them acquire the skills that enable them to read independently. Whether she uses a basal reader, ability grouping, or individualized instruction, she should provide the opportunity, both as an integral part of the program and as independent drill, for her pupils to develop word attack skills.

Teachers should not, however, put too much close emphasis on phonics too early in a child's reading program. The child must learn to scrutinize words and to recognize minute differences in them in order to avoid harmful guessing; but overemphasis on phonics without corresponding emphasis on whole words and phrases leads to what has been termed as "an atomistic approach" to reading. Such reading—with its stress on single words, syllables, and letters—also makes it difficult for the child to pay close enough attention to meaning in order to understand and retain what he reads.

ALTHOUGH no other single aid to word attack is so important as phonetic analysis, advocates of pure phonics in beginning reading overlook an extremely important consideration: In order to use phonics in unlocking new words it is necessary for children to make generalizations. In other words, they must proceed from the specific to the general case and then back to the specific. Some very bright children are apparently capable of generalizing from only one or two examples; others of lower mentality have trouble in generalizing even after repeated examples.

A number of studies have shown that children need to have a mental age of at least 7 years in order to profit fully from formal instruction in phonics and that systematic phonics instruction should be postponed until then.

Dr. Cutts, specialist for reading, Division of Elementary and Secondary Education, came to the Office of Education in 1961 from Kent State University, where he had organized and directed the university's Reading Center. Earlier he had served as coordinator of veterans' education for the Georgia State Board of Education. He has taught reading at every level from the primary grades through graduate school. He has contributed numerous articles to professional journals and is the author of Better Reading Through Research, *a volume in the Education Library of the Center for Applied Research in Education.*

Although educators are not in complete agreement on this point and generally are reluctant to determine readiness by hard and fast rules relating to either chronological or mental age, the best evidence available is that most children are not ready to take full advantage of phonics as an aid to word attack until they are in the second grade.

Ear training, which is fundamental to children's learning to understand and use phonics, should be introduced much earlier. In fact, as early as kindergarten, children can be taught to identify beginning sounds (for example, cat, cub, car, cake; box, boy, buy, and book; make, mother; and rhyming words) and to distinguish between sounds produced by different materials (for example, wood on wood, metal on metal, and others).

The first-grade teacher should continue work on the fundamentals of phonics throughout the year. She can help her pupils develop the visual perception they need for reading by teaching them to identify and name the letters. She might have them find all the words beginning with a certain letter in a newspaper article; they might, for example, circle all the a's or cross out all the m's or p's. She would, of course, make sure that they learned the names of each letter as they went along.

Once pupils have learned the names of the letters, the teacher has a convenient label for symbols and can more easily designate a word or a part of a word to which she wishes to direct their attention. But the knowledge is more important to the pupils, for it is an aid to their visual perception and helps them distinguish between words of similar form.

In essence, phonics instruction should be planned in gradual steps on a solid foundation. Children must not be taken too rapidly, and they must be permitted to work through the various skills of a given grade level even though their reading achievement and independent reading may be several grades higher. This careful sequential planning is sometimes called programed learning. Phonetic analysis is particularly adaptable to such methods.

The principle of readiness is just as important to phonics as it is to other aspects of reading. Pupils in the primary grades must hear the difference between various letter sounds and be able to recognize the same sound in different words before they can use phonics in word attack. They must also be able to produce these sounds in their own speech. It is not enough for them merely to hear rhymes and word sounds; they must learn how different sounds feel to their own lips and tongues as they produce them correctly. Their teachers can help them by giving greater emphasis to speaking and listening as a part of phonics instruction as well as a part of general language development.

TEACHERS should encourage a pupil who speaks indistinctly or who habitually slights or inaccurately produces certain sounds to speak more accurately, and they should see that he gets as much oral practice as possible in the classroom. If his articulation continues to be faulty and his speech slovenly, he may be failing to hear the right sound, either because of poor hearing or poor auditory perception. If the cause is poor hearing, the proper therapy or a hearing aid should be provided; if poor auditory perception, remedial teaching devices should be used. One such teaching device is a tape recorder.

At one reading clinic reporting on the use of a tape recorder, a boy named Joe was having particular trouble with the *th* digraph. For example, he would say "dis" for *this*, "dese" for *these*, and "dose" for *those*, and so on. It was found that he was capable of producing the voiced "th" after he had been taught to vibrate the tip of his tongue against his upper teeth. The use of a mirror helped him to accomplish this.

Still, he persisted in his old habits. The instructor would pronounce *those* for him and Joe would insist:

Dat's what I said, *dose!*"

It was not until the clinician employed a tape recorder, letting Joe hear the play-back, that he was finally able to hear and say the words correctly. Even then, it was necessary for the instructor to make a gradual transition, first saying the words for Joe just as he was *mis*pronouncing them, until he became able to repeat them just as they were spoken for him. This is doubtless a technique which would have value in other instructional situations where auditory perception and oral mimicry are involved.

Furthermore, this technique points up a sound teaching principle: *We must first go where the child is, before attempting to lead him where we want him to go.*

Teachers in the primary grades should avoid the common pitfall of handing pupils a crutch or an aid to word recognition which they must later discard and which may even interfere with an intelligent use of word attack skills. In many instances it is better for a teacher simply to tell the pupil a word with which he is having difficulty than to compel him to struggle through a tortuous process that has little or no meaning to him. It would be far better for her to say the word and let the pupil sail on than to give him a crutch not transferable to other and more general situations.

Please note that I have not said a teacher should never allow Johnny to stop and work out a word. She should even remind him that this word is like the one that stumped him on the preceding page, but she should avoid such help as "the a is long," "the i is short," or "it rhymes

with mitten." It would be better for her to print several words on a card, a sheet of paper, or the chalkboard—words that Johnny knows—and let him discover a relationship between them and the word that is causing him trouble. For example, in the sentence, "Bob looked for the rake so that he could rake the leaves," suppose that Johnny is stumped on the word "rake." Since this is a word that he should be able to analyze for himself he should be permitted to do so. But how should his teacher proceed?

First she would ask Johnny to read silently the rest of the sentence. This may be all the help he needs, for the word "leaves" may give him a context clue to the word he doesn't know. If so, fine. But to reinforce Johnny's memory of the word and to assist him in learning to recognize similar words automatically she should ask him to list several words that are similar to rake before moving on. She should also look ahead and find other sentences containing the word "rake." If there are others, she should ask Johnny to identify the word in each of them and read the phrase or sentence containing it.

BUT SUPPOSE Johnny doesn't recognize the word after reading the rest of the sentence? What then? First, he should be asked to say the final word in the sentence to make sure that he has the benefit of the context clue. If he does not recognize it, he would be asked to go back to the story and read one of the earlier sentences containing the word "leaves." If it hasn't been used earlier, the teacher should tell him the word but ask him to give its meaning in various contexts. If the word "leaves" doesn't lead Johnny to recognize the word "rake," he should then be asked to substitute consonants for the initial *r*. His teacher might write the word on the blackboard, cover the letter *r*, and say to him, "Suppose this were an *m*, what would the word be? an *l*? a *t*? and so on.

If the teacher thinks that Johnny needs additional help she might ask him to pronounce -a-k-e. If he is familiar with the silent *e*, she should ask him what effect the final *e* had on the *a*. To reinforce his learning and to help him make the consonant substitutions, she should write several similar words like make, take, lake, bake, and rake for him to read aloud and discuss, having him point out the common elements and arrive at one or more generalizations.

If Johnny cannot substitute *r* for the other initial consonants it may be because he has not learned to associate the initial *r* with two or more sight words or because he is having trouble pronouncing the sound of *r*. If he is having such difficulty, the teacher should already be aware of it and should not put him through the procedure described. Instead she would tell him the word immediately and make a note that he should receive corrective instruction, individually or in a special group. If she thinks that a reminder of the sound of the initial *r* will help, she can write the words "rat," "red," and "run," for him and ask him to substitute the *r* sound in these words for the *m* in make.

The main objective in practice with phonics and in leading children through the steps of word attack should be to help them understand phonetic principles to be applied in other situations. Teachers do children a disservice if they forget this objective. They should not, for example, teach *rules* but teach principles and generalizations; and even these should be frequently qualified with such words as "usually . . . but sometimes . . ." Teachers should also avoid burdening children, especially those in the primary grades, with too many principles and generalizations, taking care to present only those which are most consistently useful.

Whatever course teachers follow in teaching phonics, they must not lose sight of one cardinal principle: Phonics must be used meaningfully and realistically. Pupils must realize the extent to which an application of phonics knowledge may vary from one situation to another. They must be helped to see that there are times when phonics will lead to the exact pronunciation, as in *hamster*, *rooster*, and *pattern*. More often, particularly with words of more than one syllable, one must be content with a close approximation, as in *principal* and *perplexed*. Probably the most important aspect of the understanding and meaningful use of phonics is the knowledge that it sometimes provides a completely erroneous and misleading pronunciation, as in *limousine*, *tachistoscopic*, and *receipted*.

Applied phonics, then, is something of a trial-and-error procedure. Practice can greatly reduce the element of error, and the more intelligent the reader and the greater his sensitivity to letter relationships in words, the more apt is he to be correct in his application of phonics. He must, however, be flexible and willing to try again when his first effort does not result in a word that makes sense in the context.

Reading experts have pointed out that not all children need the same amount of practice with phonics to acquire skill in reading. Their statement should not, however, be misinterpreted, for only a very few exceptionally bright youngsters can safely bypass phonics instruction. All need a good foundation in phonics, even those who manage to read with understanding from material several grades above their placement in school.

To make sure that all pupils do get a good foundation, schools should provide some means such as a checklist or oral quiz for determining each pupil's mastery of phonics

and word attack skills at the beginning and end of each school year. The information obtained should be recorded in the pupil's permanent school record and passed on to his next teacher. With the record handy, the teacher would be less likely to make unfounded assumptions of what her pupils knew about phonics.

TEACHERS of reading cannot avoid their responsibility for phonics instruction. Incidental teaching is not enough; direct, systematic teaching must be related to reading that makes sense to the pupils. Phonics cannot be used in isolation and should not be taught in isolation; it is one part of the reading program. Without syllabication, along with other aspects of structural analysis, and intelligent use of context, phonics loses much of its usefulness as a tool. It should never become such a dominant part of the reading program that it stifles interest and results in a laborious word-by-word approach.

The Texas educational microwave project

R. C. NORRIS

THE TEXAS EDUCATIONAL Microwave Project—TEMP—completed its first year of full-system operation on August 31, 1962. It is a project which joins 11 colleges and universities in Central Texas in a demonstration closed-circuit television project offering courses to students at all participating institutions. The technical system covers about 100 miles and includes institutions in five cities: Southwestern University (Georgetown); University of Texas, Huston-Tillotson College, and St. Edward's University (Austin); Southwest Texas State College (San Marcos); Texas Lutheran College (Seguin); and Trinity University, St. Mary's University, Our Lady of the Lake College, Incarnate Word, and San Antonio College (San Antonio). Eight of the 11 institutions are church-related, two are State supported, and one is a municipal junior college. The official title of the project is "A Field Study in the Wider Use, by Means of Microwave Television, of Faculty Resources Among a Number of Institutions of Higher Education," but it operates under the less bulky name of Texas Educational Microwave Project, further shortened to the acronym TEMP. Administrative offices of the project are at Radio/Television, The University of Texas. In addition to a project coordinator, TEMP has an academic coordinator who is primarily responsible for working with classroom teachers to assist them in using the TEMP course materials. E. B. Everitt, dean of Texas Lutheran College, is presently serving in this capacity.

TEMP has received financial support from three sources: The Office of Education, the participating institutions, and the Ford Foundation. Through contracts under the educational media program (title VII–B of the National Defense Education Act), the Office has contributed $369,812 to the project. Much of the initial support for TEMP came from the Office. Each institution to date has contributed $8,000. The Ford Foundation is paying the released-time salaries of the television instructors to the amount of $139,120, through arrangements made after the project got under way.

The project began as a one-semester pilot project offering two courses—the Great Plains and psychology—to the three institutions in Austin. Its first full program began on September 18, 1961, with eight courses for 3,855 students. Three more courses were added at the second year. The year's program included these courses and instructors (the courses marked with an asterisk were added at the second year):

Course	*Instructor*
American History	David Trimble, San Antonio College
College Chemistry	L. O. Morgan, University of Texas
Focus on German	Leroy Shaw, University of Texas
The Great Plains	Walter P. Webb, University of Texas
The Great Frontier*	Walter P. Webb, University of Texas
Introduction to Psychology	Fillmore Sanford, University of Texas
Modern Mathematics	James Gray, St. Mary's University
Music Appreciation	Marjorie Walthall, San Antonio College
Science for Elementary Teachers	R. T. Gary, Southwest Texas State College
Physical Anthropology*	Thomas McKern, University of Texas
Introduction to the Visual Arts	Donald Weismann, University of Texas

Early in 1960 committees representing the various academic disciplines offered by the participating institutions

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Dr. Norris is the assistant director of Radio/Television at The University of Texas and the project coordinator for the Texas Educational Microwave Project. He is also an assistant professor of speech at the university.

selected courses and instructors for TEMP. The committees sought to make two types of courses available—the unusual and the generally required. Dr. Webb's course on The Great Plains is an example of the unusual in that he developed it himself and it was offered only by The University of Texas. Dr. Trimble's required course in American history is an example of the second type in that it was a course offered by all the institutions.

All of the courses offered, with the exception of The Great Plains, originally consisted of two 45-minute videotaped lectures and a 45-minute period with a live instructor each week. The last period gave the students an opportunity to discuss the television lecture and to ask questions about it. After 6 weeks of operation, the program for mathematics was changed to a 30-minute program three times a week to give students a 20-minute period during each meeting for questions and discussion. After the first semester, Focus on German was changed to a once-a-week, 45-minute format. Both changes were made in response to the needs of the institutions.

Each institution tests and grades its own students. Some studio instructors have prepared model examinations for the classroom teacher, but in general each teacher prepares the examination questions for his class. There is a teacher's manual for each course.

Although most students taking courses through TEMP have no face-to-face communication with the lecturer during two-thirds of the courses, they do have the benefit of two instructors. The second instructor is available for discussion and questions, usually during the third lecture

Channels of Communication

A monthly report by SETH SPAULDING, chief, Research and Services Section, Educational Media Branch, Office of Education.

The Federal Communications Commission (FCC) may shortly announce its decision on whether to establish a new class of educational television service, generally known as the 2,000-megacycle development. If it decides in the affirmative, it will set aside for local school systems and other educational agencies one of two frequency bands—1,990-to-2,110 megacycles or 2,500-to-2,690. The new service would provide for the licensing of "fixed" instructional TV systems, which would transmit programs to a small number of selected receivers—not to home receivers in general.

Since July 26, 1962, when the FCC announced its intention to consider the establishment of this new class of educational television service, it has been receiving position statements from city school systems, colleges and universities, and State departments of education, as well as from educational and commercial broadcasting units, State educational broadcasting commissions, and commercial services, and is taking all of these into consideration in reaching its decision on whether to establish the service.

In describing the proposed service, the FCC says (in its Public Notice No. 23340, issued simultaneously with its notice of proposed rulemaking for the new service, Docket No. 14744): "[It] would enable a central transmitter to serve scattered local schools or other reception points, which would convert the transmissions for viewing on conventional television receivers at those places. The number of channels would be sufficient to permit sending different subjects simultaneously to different classrooms." The FCC makes it clear that, with 10 watts peak visual power and 1 watt average aural power, the low-power signal with adequate antennas and conversion equipment can provide good picture quality.

In effect, the FCC says, the new service would be a multiple-address system to supplement the educational TV broadcast service. McIvor Parker, staff engineer for the FCC, says, "We do not consider the proposed service to be a substitute for educational broadcasting. Broadcasting stations can perform the dual role of service for in-school and in-home instruction, as well as a source of quality programing for the public. The proposed new service will serve only those locations equipped with special receiving equipment." The same opinion is expressed by the Southern Regional Education Board in its *Educational Television Bulletin* for October 1962: "It cannot be considered as a substitute for educational broadcasting as that now exists, nor will it obviate the necessity for further expansion of present services in the standard VHF and UHF bands. Where the necessary special receiving equipment is installed, the 2,000-mc range will constitute a supplementary method of transmission and will thus make possible an expanded and more flexible overall program."

The *Bulletin* goes on to say: "Sufficient equipment and antenna systems for this band have not yet been developed. The transmission system itself is low-cost and will allow low-power, directional transmission to selected sites in a local area. Special antenna and converter will be required to translate its signals for reception on ordinary television sets. To what extent this will tend to offset the low transmission costs is not yet known. In addition . . . regardless of the type of transmission system used, costs of programing equipment, studies, cameras, controls, etc., remain the same."

Very little information is as yet available on the proposed new service. Once it is established, the Office of Education will stand ready, through its educational media program, to receive proposals for research on programing and to provide information and other help. For the time being, the best sources of information are the FCC itself, Washington 25, D.C.; the National Association of Educational

of the week. For a single tuition fee the student draws on the faculty resources of several campuses.

The project so far has not included supplementary or "enrichment" instructional material. But, because a number of the institutions are interested in such material, an advisory committee is developing proposals for supplementary material for the approval of TEMP members.

The initial physical linking of so many institutions over such a wide geographic area was itself the first significant demonstration of feasibility of the project. The manufacturer's (Collins Radio Company) serial number for the equipment used by TEMP is No. 1—a significant number, for the TEMP program is the first use by educators of the microwave frequencies in the bands of 6 kilo-megacycles and 12 kilo-megacycles for cross-country linkage. It is also the first regular operational use of the 12-kilo-megacycle band by any agency anywhere, as far as we know.

One of the greatest problems the project has overcome in sharing faculty resources is that of scheduling—of fitting television classes into the bell schedules of so many institutions. At present only two courses (chemistry and German) must be televised for both morning and afternoon periods. The project, however, continues to have the problem of revision. It must revise its schedule to introduce new lectures and to complete new courses to meet the changing needs of the institutions. In addition, it must revise in order to explore new techniques of using television effectively to improve live-class periods. The exploration of the entire project continues.

Broadcasters, 1346 Connecticut Avenue, N.W., Washington 6, D.C.; and the National Educational Television and Radio Center, 10 Columbus Circle, New York 19, N.Y. For a copy of the 4-page statement submitted to the FCC by the U.S. Department of Health, Education, and Welfare, write to Ivan A. Nestingen, Under Secretary of Health, Education, and Welfare, Washington 25, D.C.

SAMPLE PRINTS and study guides of some 100 recorded telecourses are now available from the National Television Library, at the National Educational Television and Radio Center, 10 Columbus Circle, New York 19, N.Y. Sampler kits for each course may be had for $5 for a 5-day period exclusive of transportation time; the user pays all postage charges. Each kit consists of a kinescope on 16mm film of one representative lesson of the course and two sets of related study guides. If, after seeing the sampler, the user decides to broadcast the course, he makes arrangements directly with the course owner, the distributor, or both. The samplers are listed in *Instructional Television Materials: A Guide to Films, Kinescopes, and Videotapes Available for Televised Use, Spring 1962*, which is provided free of charge both by the National Library and by the Great Plains Regional Instructional Television Library, University of Nebraska, Lincoln 8, Nebraska, and the Northeastern Regional Instructional Television Library, 238 Main Street, Cambridge 42, Massachusetts.

These libraries were established about a year ago as pilot demonstrations under title VII of the National Defense Education Act (NDEA), to provide a mechanism whereby all educational institutions could exchange programs of quality. Under their sponsorship, evaluative committees throughout the country, made up of members of the staffs of local schools and of ETV stations, have examined some 500 recorded instructional television courses and found that few are of technical or educational quality sufficient to merit use in school systems beyond the one in which they were produced. Two endorsed courses are now available through the Great Plains Library—*General Psychology*, by Fred McKinney of the University of Missouri, and *Focus*, by John Gibson of Babson Institute; the latter is a series on democracy and competing ideologies. In addition, all three libraries are distributing, as a service, a number of nonendorsed courses. For further information on review and endorsement procedures and on acquisition and distribution policies, write to any of the libraries.

THE EDUCATIONAL MEDIA COUNCIL has announced that work is well along on the *Educational Media Index*, which will be the first comprehensive directory of media materials—that is, films, kinescopes, television recordings, slide sets, voice recordings, programed instructional materials, sets of transparencies, filmstrips, etc.—available in the United States. It is being prepared by the McGraw-Hill Book Co. under subcontract with the Educational Media Council and is being supported under title VII of the NDEA. No decision has been made on who will publish it, but the possibility of inviting commercial publishers to bid for the distribution of the directory is being considered.

The directory will consist of 17 subdirectories and 1 master title index. Two subdirectories will be for the elementary school—one for kindergarten to grade 3 and one for grades 4 to 6—and 15 will cover subject-matter areas for grade 7 and above. For further information, write to the Educational Media Council, 250 West 57th Street, New York 19, N.Y.

THE BUREAU OF SOCIAL Science Research, Inc., which, under Office of Education sponsorship, has made a survey of audiovisual equipment and materials in U.S. public school districts in the spring of 1961, has released preliminary tabulations of data. Responses from the sample indicate that in schools throughout the country 4 types of equipment are in especially short supply:

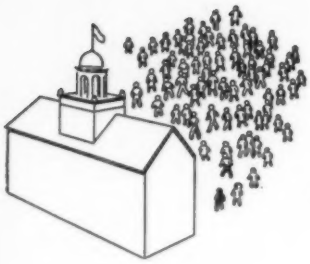
Slide projectors (2 x 2). Schools have 6,400, need another 6,400.

Television receivers. Schools have 50,000, need 49,600 more.

Overhead projectors. Schools have 13,900, need 29,400 more.

Language laboratory installations. Schools have 4,600, need 8,500 more.

For a summary of the complete study, write to Eleanor P. Godfrey, BSSR, 1424 Sixteenth St., N.W., Washington 6, D.C.



ENROLLMENT, TEACHERS, AND SCHOOLHOUSING

Highlights From the Fall 1962 Survey of Public Schools

ENROLLMENT in public elementary and secondary schools rose to a new peak in the fall of 1962, according to the Office of Education's ninth annual survey. Every fall after school opens State departments of education report to the Office of Education on selected basic items of information about the public elementary and secondary schools. The figures in this article are taken from an advance release issued by the Office of Education on January 9, 1963. The fall 1962 survey was conducted by Samuel Schloss and Carol Joy Hobson of the Division of Educational Statistics.

Copies of the release, HEW–W18, can be obtained by writing to Mr. Schloss (Office of Education, Department of Health, Education, and Welfare, Washington 25, D.C.).

Pupil enrollments

Public school enrollments reached 38.8 million, an increase of 1.4 million over the previous fall.

Elementary schools enrolled 25.4 million; secondary schools, 13.5 million. The percent of increase in the elementary schools is 3.0; in the secondary, 4.8.

Classroom teachers

School systems employed about 1,511,000 full- and part-time teachers; 889,000 in elementary schools, 622,000 in secondary. This was a gain of 3.4 percent over the 1961 total, as compared with an increase of 3.7 percent in the number of pupils.

Substandard credentials

About 83,000 or 5.5 percent of the full-time and part-time teachers employed failed to meet full State certification standards, as compared with 6.3 percent in the fall of 1961.

Classrooms completed

School districts completed about 72,000 classrooms in 1961–62, slightly below the peak of 72,200 classrooms completed in 1960–61. Completions include both new construction and conversions from other uses to instructional purposes.

Classrooms scheduled for completion

The States reported that 58,900 classrooms are scheduled for completion in 1962–63. The Office points out, however, from studies of other recent surveys, that completions may exceed this figure.

Classrooms abandoned

About 18,100 classrooms were abandoned during the 1961–62 school year because of consolidation of school districts, population shifts, and obsolescence of buildings. This compares with 18,700 abandoned during the school year 1960–61.

Pupils in excess of capacity

About 1.7 million pupils were in excess of normal classroom capacity—that is, they were attending school on curtailed sessions or were housed in overcrowded classrooms, makeshift or improvised quarters, and rented facilities. The number in excess is only 26,000 under the number reported in the 1961 survey.

Classroom shortage

Classroom shortages totaled 121,200, a decrease of 4.8 percent from the 1961 figure of 127,300. The shortage figure in the fall of 1962 was divided about evenly between the number of classrooms needed to accommodate pupils in excess of normal capacity and the number needed to replace unsatisfactory or obsolete facilities.

High school graduates

About 1,686,000 pupils graduated from public high schools in 1961–62, representing nearly 70 percent of the class that entered the ninth grade 4 years earlier. In 1959–60 the percentage was 68.7.

Local school districts

There are 33,000 local school districts in the United States. Of these, 4,200 do not operate any schools; they send their resident children elsewhere to school.

Enrollment, teachers, and schoolhousing in full-time public elementary and secondary day schools, by State, fall 1962

[Unless otherwise noted, "elementary" includes kindergarten and "secondary" includes junior high school]

State	Pupils enrolled		Total classroom teachers		Teachers with substandard credentials		Pupils in excess of normal capacity of school plants in use		Classrooms scheduled for completion in 1962–63	Local basic administrative units (school districts) [1]	High school graduates 1961–62
	Elementary	Secondary	Elementary	Secondary	Elementary	Secondary	Elementary	Secondary			
50 States and D.C. [2]	25,352,586	13,484,024	889,012	622,239	55,912	26,931	914,510	752,201	58,888	33,086	1,686,126
Ala.	488,754	323,267	14,585	12,348	1,304	903	28,300	14,000	1,504	117	30,455
Alaska	40,511	9,771	1,565	625	50	18	4,075	800	93	34	1,424
Ariz. [3]	266,164	86,599	10,100	3,650	43	13	6,212	3,536	618	307	12,499
Ark.	252,860	182,677	8,695	7,185	570	229	7,610	10,624	561	417	19,328
Calif.	2,505,500	1,249,500	80,500	49,500	5,000	2,000	25,000	5,000	8,000	1,577	166,500
Colo.	269,350	168,962	10,547	8,266	206	66	14,382	12,876	736	263	17,367
Conn.	366,368	153,389	12,528	8,417	1,020	680	10,599	5,887	900	177	21,941
Del.	[4] 52,385	39,105	[4] 2,015	1,905	210	339	1,294	988	277	87	4,026
D.C.	86,147	46,753	2,787	1,983	1,050	650	11,159	5,296	145	1	3,517
Fla.	628,673	465,268	22,453	19,274	289	32	32,612	41,218	1,759	67	42,882
Ga. [5]	664,892	326,233	21,822	12,670	333	166	42,101	34,781	1,999	197	36,014
Hawaii [6]	90,363	61,700	3,079	2,053	22	33	3,165	1,791	463	1	7,793
Idaho [6]	91,740	74,920	3,702	3,294	1,181	371	4,262	3,667	245	117	8,722
Ill.	1,327,543	562,203	51,317	26,753	1,322	374	67,729	25,607	2,406	1,509	82,739
Ind.	660,378	368,610	22,174	17,555	1,161	241	15,611	14,235	1,335	779	46,825
Iowa	371,209	226,629	14,872	11,866	220	100	12,098	11,496	600	1,231	30,081
Kans. [3]	381,961	119,741	14,128	7,047	----------	----------	[7] 12,000	[7] 7,500	[8] 350	2,000	24,715
Ky.	438,770	208,433	15,686	8,831	1,900	200	20,689	18,930	982	206	23,759
La. [3]	578,000	182,000	16,950	11,150	972	478	11,285	3,733	1,106	67	28,492
Maine	148,172	64,488	5,831	2,938	277	142	6,568	6,350	255	457	8,655
Md.	386,422	281,517	13,582	12,749	4,553	2,245	30,389	24,825	1,320	24	26,438
Mass.	573,550	369,639	20,381	17,248	446	549	19,020	16,833	1,421	390	45,826
Mich. [9]	1,091,005	700,916	39,121	30,119	3,923	1,927	42,171	41,813	2,640	1,738	75,323
Minn.	420,413	312,363	15,435	14,956	541	121	17,118	15,950	999	2,271	38,340
Miss.	355,398	207,349	11,200	7,900	421	278	8,249	3,901	670	150	22,094
Mo. [3]	[5] 641,126	[5] 216,494	[5] 21,687	[5] 10,866	1,817	77	167	36,403	1,564	1,633	40,174
Mont.	104,795	52,204	4,787	2,524	68	2	1,864	1,367	288	1,017	7,413
Nebr.	194,196	106,344	8,728	5,688	429	113	11,396	6,766	396	3,090	14,469
Nev.	51,918	28,275	1,941	1,323	----------	----------	2,988	1,748	237	17	2,638
N.H.	75,705	39,966	2,857	1,892	86	64	2,996	1,762	183	223	4,896
N.J.	776,357	382,926	31,127	19,815	5,050	1,706	57,564	31,079	1,928	591	50,977
N. Mex. [6]	139,214	100,198	5,157	4,280	204	81	6,834	3,897	360	91	8,971
N.Y. [6]	1,712,257	1,230,910	67,065	60,714	2,540	4,001	91,718	81,578	3,784	1,204	131,741
N.C. [3]	839,359	300,922	28,047	11,558	1,131	182	26,142	32,627	1,144	173	48,068
N. Dak.	90,597	51,289	4,080	2,807	13	10	3,395	2,094	363	826	7,604
Ohio [3]	1,537,908	544,226	48,019	31,887	5,071	2,863	37,472	24,255	3,120	812	86,681
Okla. [6]	318,870	244,000	12,075	9,300	----------	----------	12,000	8,000	1,150	1,180	27,052
Oreg.	263,458	149,197	11,400	7,243	1,950	50	4,105	4,328	824	452	20,127
Pa.	1,163,749	895,662	40,413	37,422	405	861	41,908	56,031	1,851	984	103,037
R.I. [6]	81,612	60,940	2,949	2,830	175	296	1,830	3,745	184	41	6,448
S.C.	384,809	226,411	12,465	9,286	20	31	16,740	11,550	398	108	23,929
S.Dak.	109,359	50,551	5,370	2,859	173	48	7,108	3,903	206	2,928	8,186
Tenn.	555,183	282,610	19,966	10,273	850	200	20,625	9,408	1,442	154	33,701
Tex. [3]	1,759,074	532,205	52,963	36,758	4,309	2,991	33,714	16,862	2,674	1,458	86,518
Utah	152,923	105,403	5,123	4,309	220	108	11,861	5,526	290	40	12,130
Vt.	53,650	24,428	2,229	1,308	62	74	2,793	2,618	32	257	3,315
Va. [3]	611,208	294,532	20,501	14,925	1,730	317	34,011	28,501	1,951	131	34,232
Wash.	399,887	284,959	14,815	11,553	1,000	100	14,166	24,964	1,514	409	33,223
W. Va.	255,053	180,979	8,611	6,728	850	200	5,820	11,208	320	55	19,527
Wis. [6]	493,028	274,087	19,429	12,043	470	130	10,357	10,344	1,203	827	41,401
Wyo.	50,763	32,274	2,153	1,766	275	271	1,238	----------	98	201	3,913
Am. Samoa	3,989	2,399	228	102	----------	2	----------	----------	184	1	[10] 122
Canal Zone	7,305	5,307	254	205	----------	----------	380	280	22	1	641
Guam	8,927	5,971	298	249	30	10	1,700	2,400	4	1	419
Puerto Rico [6]	392,119	199,890	8,962	5,786	617	2,729	117,949	40,247	527	1	15,610
Virgin Islands [6]	5,871	2,088	157	145	----------	----------	1,120	675	47	1	212

[1] Represents total number of districts, including those not operating schools. [2] National totals, though shown to the last digit, are not in fact that precise; they are merely the sums of State figures, which included both rounded and unrounded figures. [3] Data for elementary and secondary schools are reported by grade group (kindergarten through grade 8 for elementary, and grades 9 through 12 for secondary). [4] Excludes data for kindergartens. [5] Data for elementary and secondary schools are reported by grade group (kindergarten through grade 7 for elementary, and grades 8 through 12 for secondary). [6] Data for elementary and secondary schools are reported by grade group (kindergarten through grade 6 for elementary, and grades 7 through 12 for secondary). [7] Incomplete; excludes data for school districts with less than 4 teachers. [8] Data for 1951–62 school year. [9] Excludes vocational schools not operated as part of the regular public school system. [10] Includes persons granted high school equivalency certificates.

Enrollment in Full-Time Public Elementary and Se... Da...

Region and State	Total	Total K–8, including elementary ungraded	Kinderg... grade				
			Kinder-garten	1st grade	2d grade	3d grade	4th g... grade
TOTAL UNITED STATES [1]	38,836,610	28,730,849	2,098,913	3,800,821	3,513,193	3,405,289	3,288,35... 5,769
NORTH ATLANTIC:							
Connecticut	519,757	390,817	47,437	50,392	47,404	44,211	41,4... 3,085
Delaware	[2] 91,490	[2] 66,668	NA	9,968	8,892	8,567	8,... 7,805
Maine	212,660	161,702	16,827	19,968	18,873	18,396	17,... 7,702
Maryland	667,939	492,618	25,788	65,956	61,420	58,861	56,... 4,734
Massachusetts	943,189	680,784	52,104	91,108	83,224	80,916	77,... 5,573
New Hampshire	115,671	84,793	4,446	11,537	10,544	9,996	9,... 9,714
New Jersey	1,159,283	845,850	109,125	102,985	95,008	93,487	89,... 9,461
New York	2,943,167	2,137,446	269,326	259,718	248,107	235,141	227,... 6,396
Pennsylvania	2,059,411	.....					
Rhode Island	142,552	102,615	9,187	13,424	12,138	11,869	11,... 1,035
Vermont	78,078	58,922	1,987	7,932	7,610	7,155	7,... 7,014
District of Columbia	132,900	102,839	11,498	16,487	13,098	11,574	10,... 0,261
GREAT LAKES AND PLAINS:							
Illinois	1,889,746	1,391,948	153,629	183,246	168,344	157,611	138,... 2,278
Indiana	1,028,988	757,853	57,403	100,327	92,320	89,119	87,... 5,769
Iowa	597,838	438,276	55,607	49,655	49,897	47,582	46,... 7,193
Kansas	501,702	381,961	38,789	49,846	46,074	44,812	42,... 0,208
Michigan	1,791,921	1,344,589	191,809	170,633	153,855	148,772	141,... 8,743
Minnesota	732,776	522,284	55,757	63,694	60,551	58,875	57,... 6,368
Missouri [1]	857,620	641,126	50,764	85,142	76,759	74,840	71,... 8,773
Nebraska	300,540	220,592	27,930	25,960	25,400	24,862	24,... 4,137
North Dakota	141,886	101,849	2,937	13,720	12,464	12,280	12,... 2,583
Ohio	2,082,134	1,537,908	159,170	201,430	183,033	176,076	167,... 2,867
South Dakota	159,910	117,814	7,269	15,157	14,624	14,106	13,... 3,739
Wisconsin	767,115	535,940	78,473	65,338	59,966	59,197	55,... 5,586
SOUTHEAST:							
Alabama	812,021	612,754	.....	86,681	80,904	78,901	76,... 2,989
Arkansas	435,537	324,882	.....	47,025	42,300	41,305	39,... 8,945
Florida	1,093,941	811,707	4,993	116,295	106,395	103,875	100,... 7,870
Georgia	991,125	746,925	10,992	104,936	98,115	94,151	91,... 9,278
Kentucky	647,203	481,673	1,224	68,840	61,462	60,865	58,... 8,277
Louisiana	760,000	578,000	6,750	85,750	76,556	74,658	73,... 8,964
Mississippi	562,747	431,625	.....	63,337	57,831	56,787	54,... 2,495
North Carolina	1,140,281	839,359	.....	113,987	108,653	107,550	105,... 3,022
South Carolina	611,220	463,205	.....	64,931	60,801	59,901	57,... 6,697
Tennessee	837,793	626,564	1,161	89,896	81,638	80,455	77,... 5,262
Virginia	905,740	688,752	6,881	95,238	90,604	88,305	85,... 3,552
West Virginia	436,032	315,895	.....	44,766	38,896	34,739	39,... 0,008
WEST AND SOUTHWEST:							
Alaska	50,282	40,511	2,724	6,263	5,611	5,331	4,... 4,504
Arizona	352,763	269,594	8,153	41,088	34,505	33,176	31,... 0,733
California	3,755,000	2,798,000	344,000	345,000	318,500	314,000	307,... 5,000
Colorado	438,312	327,310	33,237	41,454	38,689	38,076	36,... 5,345
Hawaii	152,063	112,271	12,962	13,781	13,141	13,171	12,... 2,405
Idaho	166,660	119,348	.....	16,470	15,628	15,360	14,... 4,753
Montana	156,999	114,308	3,201	15,482	14,608	14,228	14,... 3,599
Nevada	80,193	61,192	6,788	8,204	7,512	6,970	6,... 6,334
New Mexico	239,412	.....					
Oklahoma	562,870	412,070	16,800	55,450	52,800	51,150	48,... 7,400
Oregon	412,655	292,705	9,221	37,526	36,289	35,736	36,... 5,652
Texas	2,291,279	1,759,074	27,500	267,031	234,016	227,835	224,... 5,568
Utah	258,326	191,155	11,946	24,791	24,142	23,672	23,... 2,312
Washington	684,846	490,681	41,268	61,232	58,029	57,103	55,... 5,158
Wyoming	83,037	61,594	4,929	7,908	7,487	7,430	7,... 6,886
OUTLYING PARTS:							
American Samoa	6,388	5,036	.....	1,043	545	548	... 683
Canal Zone	12,612	9,096	989	1,101	1,145	1,048	... 982
Guam	14,898	11,318	.....	1,649	1,530	1,429	1,... 1,445
Puerto Rico	592,009	483,431	1,387	79,339	72,625	68,211	62,... 6,116
Virgin Islands	7,959	6,780	496	869	938	818	... 762

[1] U.S. totals for individual grades and groups of grades include estimates for nonreporting states. [2] Excludes kindergarten enrollment... duates

Day Schools, by Grade and by State: Fall 1962

grade 8					Total 9–12, including postgraduate and secondary ungraded	Grades 9 through 12 and postgraduate					
grade	6th grade	7th grade	8th grade	Elementary ungraded		9th grade	10th grade	11th grade	12th grade	Post-graduate	Ungraded secondary
5,769	3,088,611	3,036,541	2,985,127	288,232	10,105,761	3,050,890	2,865,121	2,255,871	1,792,677	4,902	136,300
2,085	38,897	36,988	36,357	4,616	128,940	38,057	36,895	30,759	23,124	105	.....
7,805	7,449	7,536	7,210	1,061	24,822	7,515	7,101	5,405	4,228	.....	573
7,702	16,783	17,201	17,698	430	50,958	15,979	15,064	10,899	8,840	176	.....
4,734	51,856	53,977	52,282	11,292	175,321	53,525	50,821	38,730	30,056	17	2,172
5,573	71,659	70,477	68,914	9,437	262,405	75,647	74,705	61,785	45,326	1,330	3,612
9,714	9,451	9,409	9,329	570	30,878	9,849	8,999	6,919	5,051	60	.....
9,461	86,621	84,069	82,555	12,860	313,433	92,021	90,402	73,035	55,554	.....	2,421
6,396	218,239	219,602	205,587	27,690	805,721	218,254	228,898	196,628	142,231	.....	19,710
DISTRIBUTION BY GRADE NOT REPORTED											
1,035	10,418	10,259	10,744	2,335	39,937	10,606	11,359	9,383	6,753	160	1,676
7,014	6,706	6,658	6,686	.....	19,156	5,890	5,392	4,236	3,536	89	13
0,261	9,699	8,696	7,996	3,474	30,061	7,252	6,287	4,517	3,492	7	8,506
2,278	144,730	125,676	143,450	14,686	497,798	147,882	144,827	112,574	85,540	.....	6,975
5,769	82,080	80,251	78,423	4,649	271,135	82,142	78,932	60,741	48,045	178	1,097
7,193	47,135	45,263	44,874	4,258	159,562	45,492	46,309	36,244	30,852	21	644
0,208	38,915	39,129	40,342	1,582	119,741	35,472	28,850	28,283	26,886	.....	250
8,743	132,938	128,777	124,807	12,500	447,332	131,078	129,799	97,239	76,716	(2)	[3] 12,500
6,368	55,785	54,841	54,368	4,635	210,492	58,211	59,278	49,601	39,920	1,596	1,886
8,773	67,739	67,552	65,442	12,657	216,494	70,763	57,916	45,645	42,170	.....	.....
4,137	23,308	22,410	22,022	435	79,948	23,088	23,269	18,174	15,322	.....	95
2,583	11,924	11,584	11,414	431	40,037	11,219	11,001	9,586	8,143	.....	88
2,867	157,258	156,222	155,915	18,914	544,226	164,578	159,532	120,705	89,948	.....	9,463
3,739	13,305	12,931	12,457	575	42,096	12,119	11,388	10,127	8,408	.....	54
5,586	53,678	50,932	50,870	6,472	231,175	65,109	66,540	53,352	44,640	12	1,522
2,989	72,467	74,608	70,202	.....	199,267	68,209	51,303	40,764	38,991	.....	.....
8,945	37,821	39,470	38,152	.....	110,655	36,350	29,921	23,354	21,030	.....	.....
7,870	93,633	94,218	90,020	3,595	282,234	86,792	81,850	64,546	47,676	.....	1,370
9,278	86,874	85,184	82,033	4,135	244,200	79,590	72,165	53,277	38,590	.....	578
8,277	57,354	56,878	55,154	2,630	165,530	53,344	47,940	37,386	25,775	.....	1,085
8,964	65,680	62,800	61,816	2,537	182,000	58,500	49,947	37,968	35,209	.....	376
2,495	50,106	49,580	45,721	967	131,122	42,927	37,011	28,625	22,401	.....	158
3,022	100,721	98,501	96,905	4,990	300,922	98,283	89,261	61,981	50,906	.....	491
6,697	54,966	54,237	50,689	3,085	148,015	47,894	42,562	32,215	25,344	.....	.....
5,262	72,612	72,254	70,179	6,055	211,229	67,399	60,481	46,865	35,533	62	889
3,552	79,629	77,231	77,544	4,310	216,988	70,075	63,103	45,605	37,194	210	801
0,008	39,758	40,051	38,351	261	120,137	37,946	34,617	27,140	20,422	.....	12
4,504	3,991	3,564	3,451	210	9,771	3,330	2,777	2,071	1,558	.....	35
0,733	29,017	30,436	29,554	1,206	83,169	27,954	22,110	17,089	15,132	643	241
5,000	281,000	276,000	275,000	42,500	957,000	275,000	258,000	223,000	167,000	.....	34,000
5,345	34,345	32,997	32,566	3,825	111,002	32,723	32,309	25,500	19,330	30	1,110
2,405	11,377	10,962	10,946	899	39,792	10,633	10,858	9,397	8,239	.....	665
4,753	14,065	13,775	13,833	542	47,312	13,896	13,554	10,617	9,245	.....	.....
3,599	12,854	13,038	12,791	433	42,691	13,085	12,098	9,596	7,912	.....	.....
6,334	6,035	5,874	5,927	752	19,001	5,700	5,866	4,228	3,078	.....	129
DISTRIBUTION BY GRADE NOT REPORTED											
7,400	45,950	46,450	46,750	620	150,800	48,400	39,650	32,800	29,950	.....	.....
5,652	33,917	33,025	33,041	1,704	119,950	34,011	35,066	28,018	22,726	.....	129
5,568	193,506	186,320	174,831	18,083	532,205	168,996	157,716	112,726	92,767	.....	.....
2,312	21,042	20,044	19,211	888	67,171	19,292	20,096	14,580	12,686	2	515
5,158	52,692	51,889	51,693	5,786	194,165	53,468	55,587	43,246	35,290	204	6,370
6,886	6,683	6,359	6,311	341	21,443	6,514	6,432	4,604	3,893	.....	.....
683	512	525	522	.....	1,352	525	527	189	111	.....	.....
982	955	917	874	101	3,516	958	956	800	728	.....	74
1,445	1,368	1,248	1,143	108	3,580	1,218	992	823	529	.....	18
6,116	51,924	49,306	42,006	.....	108,578	35,814	31,930	23,588	17,246	.....	.....
762	725	808	545	.....	1,179	405	328	251	195	.....	.....

lment. [2] Graduates included with ungraded secondary enrollment. [3] Data for 1961–62 school year. NA—Data not available.

RALPH L. HOAG

Training for teachers of the deaf

ON SEPTEMBER 22, 1961, when President Kennedy signed Public Law 87–276, the first grants-in-aid program "to encourage and facilitate the training of more teachers of the deaf" went into effect. Now, less than 18 months later, the law is in full operation: Nearly $1.5 million in Federal funds has been allocated—$732,861 to 25 public colleges and universities and $762,377 to 18 private; these 43 institutions have improved or established training programs; and 290 graduate students and 156 undergraduates are enrolled in the programs. These institutions are well distributed geographically over the United States, which means that deaf children in all parts of the country will soon benefit from the increased supply of teachers.

There was no doubt about the need for the grants-in-aid legislation. In its committee hearings on the proposed bill, the Congress heard convincing evidence that because of the shortage of specially trained teachers (estimated at 500 in 1960) and the substandard training of some of those employed, approximately 8,000 deaf children in the country were not receiving the specialized help they needed.

It doesn't take much imagination to understand what being deprived of special help in school means to deaf children. Except for their handicap, they are like any other group of school children, some exceptionally bright and talented, some average, and some dull. But because of their handicap they need special help to develop their ability; they need teachers who understand their problems, who have been trained to deal with such problems. Without such teachers many of the deaf children now of school age—the total is estimated at 35,000—would face a bleak future, their ambitions frustrated and their lives deprived of the pleasure and satisfaction that only a trained mind can enjoy.

By enacting Public Law 87–276, the Congress made sure that teachers would be trained and that their training would be the best that experts in the field could devise. The legislation not only authorizes the appropriation of $1.5 million a year in fiscal year 1962 and 1963 to support a training program but also prescribes for administration of the program. It requires the U.S. Commissioner of Education to establish and conduct a program of grants-in-aid to accredited colleges and universities for improving or establishing programs for training teachers of the deaf and for supporting scholarships for qualified persons interested in enrolling in them. In addition the law requires the Commissioner to appoint an advisory committee to assist him, the committee to be responsible for the following duties:

> To review the operation of the grants-in-aid program to determine the extent to which it is carrying out the purposes for which it was established.
>
> To review all applications for grants and recommend approval or disapproval to the Commissioner.
>
> To submit recommendations to the Commissioner on the operation and administration of the law.
>
> To submit recommendations to the Commissioner on legislation which it considers necessary or desirable to carry out the purposes of the law.

In December 1961 the Commissioner appointed a committee of 12 persons, 6 representing institutions supporting programs for training teachers of the deaf, 3 representing institutions administering such programs, and 3 persons who have shown a special interest in the education of the deaf, representing the lay public. (See *School Life*, January–February 1962, for names of members.)

Within the Office of Education the Commissioner delegated responsibility for the program to E. Glenn Featherston, assistant commissioner and director, Division of State and Local School Systems, which has since become the Division of Elementary and Secondary Education. At the same time the Commissioner appointed Clarence D. O'Connor, superintendent of the Lexington School for the Deaf, New York City, as part-time director of the program to assist Dr. Featherston. Dr. O'Connor has since re-

Dr. Hoag is the Office of Education's first full-time specialist in the education of the deaf. Before he joined the staff of the Division of Elementary and Secondary Education in October 1962, he was coordinator of the program for training teachers of the deaf at the University of Arizona and the Arizona School for the Deaf.

Children in the preparatory class at the School for the Deaf, University of Oklahoma Medical Center, Oklahoma City.

turned to his position in New York but continues to serve the program as a member of the advisory committee.

At its first meeting in January 1962, the advisory committee made recommendations on these five items: The basic criteria to be used in evaluating applications from institutions of higher education for participating in the program; the size and kind of stipends to students and of supporting grants-in-aid to institutions; the requirements for students eligibility which would insure that a number of teachers would be ready to teach upon completion of the first year of the program; the limitations and duration of scholarships to be awarded; and a workable timetable for the program during the 1962–63 academic year. The committee selected Office of Education Bulletin 1956, No. 6, *Teachers of Children Who Are Deaf*, by Romaine P. Mackie and Lloyd M. Dunn, for use in evaluating the curriculum in the training programs.

The Commissioner accepted the committee's recommendations as the basis for administering the program.

Immediately after the first committee meeting, the Office prepared and published pamphlets on the program and application forms for general distribution to institutions conducting programs of general teacher education.

In February 1962, at a 1-day meeting of representatives of colleges and universities, State agencies, city school systems, and residential schools for the deaf, the Commissioner asked for an evaluation of the program that had been planned and for recommendations on additions to it. At this meeting the Commissioner announced that the National Council for Accreditation of Teacher Education (NCATE) would be responsible for accrediting the institutions applying for participation in the program. NCATE, acting in this capacity, agreed to use the professional services of the Conference of Executives of American Schools for the Deaf for providing technical assistance specifically related to the training of teachers of the deaf.

In March and in May 1962, at its second and third meetings, the committee reviewed the applications from institutions interested in participating in the program. In its review the committee gave close attention to the institutions' course offerings in relation to credit hours and curriculum content, the professional preparation of instructors in the program, and practice centers which students would use for observation and practice teaching. The members also identified these significant items for consideration: The background training of master teachers serving the program, the number and kind of classes available, the accessibility of the practice center to the university or college. Before the end of May, 43 colleges had been selected as training centers, and by June 30, the program was completed and on its way.

Though the program moved rapidly after it was authorized, many dedicated people seriously concerned with the education of the deaf had worked for years to make it possible. These persons, working through their professional associations, together with congressional leaders and their staff, were largely responsible for its authorization.

Insofar as I can tell from the records of several organizations, the movement to secure legislation of this kind originated a decade or so ago in the efforts of three professional groups—the Conference of Executives of American Schools for the Deaf, the Alexander Graham Bell As-

Student trainee working with a deaf child at the Eastern New Mexico University, Portales.

Deaf child learning to talk at the Lexington School for the Deaf, New York City.

sociation of the Deaf, and the Convention of American Instructors. The movement gained momentum when leaders of these three groups, in a meeting held in Washington in October 1960 to consider the teacher shortage, decided to form a new association and work together for a common objective. (Their organization has become officially known as the Council on the Education of the Deaf.) Before they joined forces, these groups had been working separately on studies of the teacher shortage.

A number of other organizations had also worked for Federal legislation; among them, the American Speech and Hearing Association; the Council for Exceptional Children; the American Hearing Society; national, State, and local organizations of the deaf; and many groups of parent organizations. In the years preceding the legislation some of these and some other groups made studies of the teacher shortage. The Office of Education, through its Branch on Exceptional Children and Youth, published a number of studies and surveys documenting the facts; one of these was the 1956 report, *Competencies Needed by Teachers of Children Who Are Deaf.*

Individuals were also much concerned about the shortage. In 1959 Evan V. Johnson, Clarke School for the Deaf, and Robert Frisina, Gallaudet College, made a comprehensive survey which was reported in *A Study of the Need for Academic Teachers of the Deaf in the United States,* published by the *American Annals of the Deaf.* And in 1960, just before the congressional hearings on the bill, George T. Pratt, director of the Clarke School for the Deaf made a telegraphic survey. Both of these studies showed a serious shortage of teachers.

The persistent efforts of these groups and individuals helped make the grants-in-aid program possible. And they have had other good results as well: they have brought groups closer together. Most people who are in one way or another connected with the general field of special education know that, historically, different philosophies of instruction have been the source of strong differences between groups within the field. During recent years, however, their common concern about the teacher shortage and other problems—for example, problems of language, speech, auditory training, and hearing evaluation—has resulted in closer understanding between groups in this field. Working together, they have secured results that they could not have secured working separately. Their realization of their common interests and of their success in united efforts should aid in achieving new and higher goals in the education of deaf children.

As of June 30, 1962, grants had been made to 43 colleges and universities participating in the grants-in-aid program for training teachers of the deaf under Public Law 87–276. The total grant to an institution provides for 1-year scholarship stipends of $2,000 to graduate students, $1,600 to undergraduate seniors, payment of tuition and fees for scholarship holders, and training grants to the institution for the improvement or establishment of programs.

(See list of institutions, p. 30.)

AD Minutes Briefly noted--- for the busy School Administrator

Material for this department is prepared by the staff of the School Administration Branch, Division of State and Local School Systems.

Tennessee high school principals average over 11 hours a day in school and related activities, teachers over 10 hours, and students over 9 hours. This fact was revealed by a special committee for the Tennessee Superintendents' Study Council in what is probably the first statewide study ever made on how school personnel, including pupils, use the hours in a school day. The inquiry included all of the State's senior high school principals, 3,036 teachers, and 9,108 pupils selected at random. During each week of the 1961–62 school year, participants kept track of their time and sent the information to the State department of education to be electronically processed. The committee is expected to make a careful analysis of the statistical findings and submit them, along with recommendations affecting the instructional program, to the council.

A report resulting from a 6-month study of Minnesota school finances recommends that the State pay $43.5 million a year more in aid to education and finance the increase with a new tax. The State now spends $150 million annually in State aid. Although the report does not specify the type of new tax needed to raise the additional funds, it does point out that 37 States had adopted a general sales tax by 1961. It also says that the State's present basic aid formula of $285 per pupil is so "unrealistic" that raising it by $50 "still would not bring it up to the cost as it actually exists in the school districts."

The study was made by former State education commissioner, Dean M. Schweickhard, and was financed by a $12,000 grant from the Hill Family Foundation.

A school building to meet the instructional needs of tomorrow will be ready for use by September 1963 in Camas, Washington. The K–6 school will feature three seven-sided structures, each housing two grade levels. Each structure will be a "school within a school" with three sections, making a total of six classrooms. The circular design eliminates the long, inside hallways typical of many schoolhouses. The central area in the middle of each structure will be used for storage of materials, reference books, audiovisual equipment; offices for teachers; and study areas for students working in groups or independently. Other features include movable walls, portable storage units, tinted windows, a folding auditorium stage, and outside entrances for each classroom.

Pupils are considered the chief source of information about the schools by Denver parents; newspapers, the chief source by non-parents. Other important sources are PTA's, school publications, radio, and television. These and other findings are reported in the fifth testing and opinion triennial survey of the Denver public schools recently completed by an independent research agency for the board of education.

A 2-year research study of the rights of public school children under the Constitution of the United States and the constitutional duties of school administrators and teachers is being conducted at the University of Louisville School of Law. Although hundreds of court decisions have been made on the rights of minors to "life, liberty, and property" under the Fourteenth Amendment, no clear-cut interpretation for school officials, children, or parents has ever been made. This study is aimed at identifying problems involving the rights of students and recommending safe procedures for protecting them. The study, under the direction of the dean of school law, was made possible through the Office of Education's cooperative research program.

Final plans for the proposed 20-classroom Sterling Park Elementary School have been sent to the Virginia State Board of Education in Richmond for approval. The 600-pupil elementary school was designed to absorb 55 decibels, in order to soften the roar of jets from Dulles International Airport 3 miles away. Basically, the school will be sealed up behind double windows, extra-thick insulated walls, and a heavy roof. The architect who designed the school building says it is the first in Virginia and one of the first on the East coast to be designed especially to cope with the problem of airport noise.

The new traffic manual prepared by the National Joint Committee on Uniform Traffic Control Devices contains recommendations for standardized use of signs, signals, markings, and other devices to regulate, warn, or guide school bus traffic. Some of the uniform standards it prescribes cover color of the school bus; color and design for school signs and crossings; and operation—for example, what to do when a school bus is stopped, when passing or meeting vehicles, or when children are boarding or leaving the bus. The

H. B. Moulton and J. N. Patronis of the Florida State Department of Education look over tape computer equipment, part of the department's data-processing machinery.

President's Committee for Traffic Safety recently invited national, State, and local traffic experts to a meeting in Washington, D.C., to review the manual and plan ways of putting it into practice.

The *Manual on Uniform Traffic Control Devices for Streets and Highways,* published by the Bureau of Public Roads, U.S. Department of Commerce, may be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., for $2.

In the past decade, Honolulu's school population has increased by an average of 4,690 pupils a year. To help meet their school building needs, the city and county have recently completed or had under construction four new schools; 194 regular classrooms; 49 special classrooms (science, homemaking, art, etc.); 18 portable classrooms; 11 physical education classrooms; and 10 shop classrooms. The cost of these and other projects such as library buildings, gymnasiums, swimming pools, and acoustical installations, add up to $8,497,055. Ten years ago, the entire school construction program cost approximately $3 million.

Mason City Junior College in Iowa, probably the first junior college to use mobile classrooms, has two mobile units installed next to the main college building. The units are providing housing for 13 different classes each day. The two sections in each unit, joined together, form a 20 by 40 foot classroom that accommodates 50 students. At the end of 2 years the school district, which now rents the units, will have the option of purchasing them, with the rental fee applying toward the purchase price. Each building has its own heating and cooling system and is completely insulated.

Passage of a $24-million bond issue and a $4.85 million tax levy in Cincinnati has launched the first phase of a long-range program for constructing needed school facilities. The campaign urging passage of the proposals was spearheaded by the Citizens Committee for Cincinnati schools composed of 189 community leaders.

A statement of purposes for Colorado schools, formulated by the Committee on Educational Goals of the State Board of Education, lists 11 educational characteristics of the behavior expected of an adult who has attended public education programs. The statement was designed to stimulate local communities to study and evaluate school programs with a view to improving and developing them in accordance with established goals.

A merit plan for teachers has completed a 1-year trial run in Davidson County, Tenn. The State department of education provided matching funds to counties expressing interest in a State-initiated plan to encourage local school systems to identify and recognize, with extra pay, a limited number of superior teachers. County officials invited teachers who met the minimum requirements of the program—qualifying scores on the National Teachers Examination, bachelor's degree, 8 years of teaching experience—to participate. Pay incentives were given on the basis of classroom efficiency; relationships with parents, staff, and community; and professional attitudes.

If the southern region of the United States is to develop rapidly, greatly increased investments in the educational enterprise will have to be made, so states the annual report of the Agricultural Policy Institute, North Carolina College at Raleigh. The report emphasizes the social, cultural, and financial benefits deriving from increased investments in education and observes that the South can no longer afford to view education as a consumption good to be enjoyed by the few, but rather must look upon education as an investment in people which can increase their productivity.

The educational data-processing movement is mushrooming—9 leading colleges now offer an EDP graduate course in preparation programs for

school administrators; 53 State and Territorial educational agencies are using or have access to EDP equipment. In addition, the Association for Educational Data Systems has just been formed, with members from all levels of education—local, State, university, and Federal—and from research organizations and manufacturers. Its members share information about current developments and trends in EDP, latest equipment and installations, cost studies, and current and planned research projects. The first issue of the *AEDS Bulletin* came off the press in December. Write to Dr. Robert D. Gates, association president, Florida State Department of Education, Tallahassee, for further information.

School enrollment in Anchorage, Alaska, has quadrupled since 1950—this year over 15,000 children are enrolled. To keep pace with the needs and changes in the fast-growing community, Superintendent Don M. Dafoe and his staff have developed, with approval of the school board, a curriculum steering committee to head an instructional improvement program. Through the use of subcommittees made up of professional and lay people, the committee will evaluate the program in all subject-matter areas and determine needs and priorities for curricular change. Serving on the steering committee will be two board members, the elementary coordinator and the assistant superintendent for instruction, five school principals, and three lay persons.

Statistic of the Month

Expenditures for education in relation to national income

NEARLY 7 CENTS out of every dollar of national income went for expenditures for education in 1961–62. These included all expenditures by all educational institutions—whether public or nonpublic and whether elementary, secondary, or higher—for current operations, capital outlay, and interest.

In general, the percentage of national income spent on education has shown an upward trend over the years; between 1929–30 and 1961–62 it increased from 3.68 percent to 6.77 percent. The trend line, however, has not been smooth.

The economic condition of the country affects the percentage spent on education. During the depression of the early thirties, the percentage rose because the national income decreased more sharply than expenditures for education. And during the mid-forties the large increase in income lowered the percentage for education.

National income data used in computing the percentages shown here are from the Department of Commerce, which defines national income as "the aggregate earnings by labor and property from the Nation's current production of goods and services. It is the sum represented by compensation of employees, proprietors' incomes, rental income, net interest, and corporate profits. Thus, it measures the total factor costs of the goods and services produced by the economy. Earnings are inclusive of taxes on those earnings."—Rose Marie Walker, educational statistician, Office of Education.

National income and total expenditures for education, United States, alternate years, 1929 to 1961

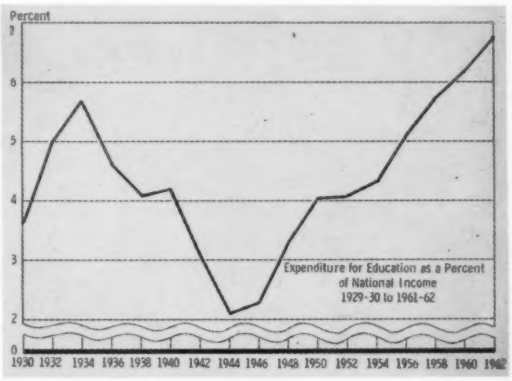
[For income, the year specified is a calendar year; for expenditures, it is the school year beginning in that year.]

Year	National income (in millions)	Expenditures for education	
		Amount (in thousands)	Percentage of national income
1929	$87,814	$3,233,601	3.68
1931	59,708	2,966,464	4.97
1933	40,159	2,294,896	5.71
1935	57,057	2,649,914	4.64
1937	73,618	3,014,074	4.09
1939	72,753	3,199,593	4.40
1941	104,710	3,203,548	3.06
1943	170,310	3,522,007	2.07
1945	181,248	4,167,597	2.30
1947	198,177	6,574,379	3.32
1949	217,690	8,795,635	4.04
1951	279,313	11,312,446	4.05
1953	305,573	13,949,876	4.57
1955	330,206	16,811,651	5.09
1957	366,943	21,119,565	5.76
1959	400,481	24,722,464	6.17
1961	427,829	[1] 28,962,000	6.77

[1] Estimated.

Note.—Beginning in 1959–60, expenditure data include Alaska and Hawaii.

Source: U.S. Department of Health, Education, and Welfare, Office of Education, *Biennial Survey of Education in the United States* and U.S. Department of Commerce, Office of Business Economics, *Survey of Current Business*, July 1958 and July 1962.



Expenditures for education as a percentage of national income, U.S.A., alternate years, 1929–30 to 1960–61

A report of some of the main findings in a survey conducted by Dr. Brown and Dr. Obourn in the fall of 1961. Their full report will be published soon, as a bulletin.

Mathematics and science teachers in U.S. high schools

KENNETH E. BROWN *and* ELLSWORTH S. OBOURN, *Office of Education specialists, respectively, in secondary school mathematics and science.*

MATHEMATICS. Of the teachers who in the fall of 1961 were teaching in grades 9 to 12 in the Nation's public schools, 1 in 5 was a mathematics teacher; that is, he was teaching at least one mathematics class a day. His major interest, however, might have been in some other field; for, of the 118,298 teachers who at that time were reported as teaching mathematics, hardly 2 in 3 were teaching it full time—4 or more classes per day.

The 76,512 full-time mathematics teachers in the fall of 1961 made up 13 percent of all the teachers in the public secondary schools. Although less than 20 percent of *all* teachers were in large schools (enrollments over 1,500), 41 percent of the full-time mathematics teachers were in such schools.

Full-time mathematics teachers were distributed among the various types of high schools as follows:

Junior high schools, 34.0 percent,
Junior-senior high schools, 32.9 percent,
Senior high schools, 9.9 percent,
Regular 4-year high schools, 23.2 percent.

This distribution differed considerably from that of all teachers in the public secondary schools (in 1958, the latest year for which data are available):

Junior high schools, 23.7 percent,
Junior-senior high schools, 32.6 percent,
Senior high schools, 14.3 percent,
Regular 4-year high schools, 29.3 percent.

These national data on teachers reflect the same fact as national data on student enrollments—that many pupils do not study mathematics in the last years of high school.

The distribution of teachers who were teaching 2 or 3 mathematics classes a day, when compared to the distribution of *all* secondary school teachers, shows that junior high schools were more likely than senior high schools to have part-time mathematics teachers:

28.9 percent in junior high schools
(23.7 percent of all teachers were there)

35.6 percent in junior-senior high schools
(32.6 percent of all teachers were there)

7.4 percent in senior high schools
(14.3 percent of all teachers were there)

28.0 percent in 4-year high schools
(29.3 percent of all teachers were there).

One in 7 mathematics teachers was teaching only one mathematics class per day—usually elementary algebra or general mathematics for 9th grade pupils. Logically enough, both the junior and junior-senior high schools had a larger percentage of their mathematics teachers in that category than either the senior or 4-year high schools. Our study did not inquire into the preparation of these teachers, but other studies indicate that most had had their major preparation in fields other than mathematics.

The fact that these teachers had only one class a day did not mean, however, that they were teaching mathe-

Mathematics teachers in public secondary day schools, grades 9 to 12, by type of school and by number of mathematics classes taught per day, fall 1961

NUMBER OF MATHEMATICS CLASSES TAUGHT PER DAY	JUNIOR HIGH SCHOOL		JUNIOR-SENIOR HIGH SCHOOL		SENIOR HIGH SCHOOL		REGULAR 4-YR HIGH SCHOOL		ALL HIGH SCHOOLS	
	Number	Percent of all math teachers in jr. h.s.	Number	Percent of all math teachers in jr.-sr. h.s.	Number	Percent of all math teachers in sr. h.s.	Number	Percent of all math teachers in 4-yr h.s.	Number	Percent of all math teachers
Four or more	25,999	67.0	25,151	61.3	7,608	74.5	17,754	62.9	76,512	64.7
Two or three	7,045	18.2	8,669	21.1	1,808	17.7	6,825	24.2	24,347	20.6
One	5,735	14.8	7,240	17.6	798	7.8	3,666	13.0	17,439	14.7
Total	38,779	100.0	41,060	100.0	10,214	100.0	28,245	100.0	118,298	100.0
Mathematics teachers new to school	6,749	17.4	8,119	19.8	1,967	19.3	6,463	22.9	23,298	19.7
Inexperienced mathematics teachers	3,837	9.9	5,069	12.3	781	7.6	2,965	10.5	12,652	10.7
Mathematics teachers also teaching science	5,364	13.8	10,049	24.5	1,176	11.5	5,626	19.9	22,215	18.8

matics to only a small number of pupils. The average size of a class in general mathematics or elementary algebra is about 27 (27.5 in 1958, the latest available data); on this basis the 17,439 one-class teachers, many of whom are uninterested and unprepared, were influencing 470,000 pupils at the very time in their lives when they most needed good instruction in mathematics. Our survey showed that these teachers were not confined to small schools: 20.2 percent of them were in large schools, compared to only 19.7 percent of *all* public high school teachers.

Twenty percent of all mathematics teachers were new to the school in which they were teaching. The regular 4-year high school had the largest percentage of new mathematics teachers; the junior high school, the smallest. The figures, which indicate a 20-percent turnover, suggest how difficult it is for high schools to carry out long-range plans for improving their mathematics programs.

One out of 10 mathematics teachers had had no previous experience in teaching. Differences among the various geographic regions in the percentages of inexperienced teachers suggest that, as teachers gain experience, they tend to move to the West and the Southwest.

One out of 10 mathematics teachers was also teaching science. Such rapid advances are being made in the knowledge about both fields that it is difficult, if not impossible, for a teacher to keep up-to-date in both; and it is only too likely that students taught by teachers teaching both subjects were getting inadequate instruction in both.

SCIENCE. Of the 103,666 teachers who were teaching one or more science classes a day in public high schools in the fall of 1961—

24.4 percent were in junior high schools
37.2 percent in junior-senior high schools
9.9 percent in senior high schools
28.5 percent in regular 4-year high schools.

Junior-senior high schools had the largest number of full-time science teachers. Of the 64,951 full-time science teachers in the fall of 1961—

26.2 percent were in junior high schools
34.3 percent in junior-senior high schools
12.6 percent in senior high schools
26.9 percent in 4-year high schools.

Junior-senior high schools also had the largest number of teachers with 2 or 3 science classes a day. Of the 23,334 teachers in that category—

21.6 percent were in junior high schools
38.0 percent in junior-senior high schools
6.8 percent in senior high schools
33.7 percent in 4-year high schools.

In fact, junior-senior high schools led in all categories of number of classes per day—partly, no doubt, because they included both upper and lower levels of pupils. Of the 15,381 teachers who were teaching only 1 class—

20.9 percent were in junior high schools
48.1 percent in junior-senior high schools
3.5 percent in senior high schools
27.5 percent in 4-year high schools.

Judging by the percentage of teachers in each type of high school who were new to the schools in which they were teaching, turnover among science teachers was greatest in the 4-year and smallest in the senior high school.

Inexperienced science teachers were least likely to be found in senior high schools, where only about 1 in 14 was inexperienced. In each of the other 3 types of schools, the ratio was about 1 in 8.

Teachers who were teaching both mathematics and science appeared most often in the junior-senior high school, where approximately 1 in 4 was teaching in both fields. At the other end of the scale was the senior high school, where the ratio was only 1 in 9.

Science teachers in public secondary day schools, grades 9 to 12, by type of school and by number of science classes taught per day, fall 1961

NUMBER OF SCIENCE CLASSES TAUGHT PER DAY	JUNIOR HIGH SCHOOL		JUNIOR-SENIOR HIGH SCHOOL		SENIOR HIGH SCHOOL		REGULAR 4-YR HIGH SCHOOL		ALL HIGH SCHOOLS	
	Number	Percent of all science teachers in jr. h.s.	Number	Percent of all science teachers in jr.-sr. h.s.	Number	Percent of all science teachers in sr. h.s.	Number	Percent of all science teachers in 4-yr h.s.	Number	Percent of all science teachers
Four or more	17,007	67.3	22,271	57.8	8,180	79.4	17,493	59.1	64,951	62.7
Two or three	5,032	19.9	8,872	23.0	1,577	15.3	7,853	26.6	23,334	22.5
One	3,214	12.7	7,393	19.2	545	5.3	4,229	14.3	15,381	14.8
Total	25,253	100.0	38,536	100.0	10,302	100.0	29,575	100.0	103,666	100.0
Science teachers new to school	5,269	20.9	18,505	22.1	1,623	15.8	7,221	24.4	22,618	21.8
Inexperienced science teachers	3,218	12.7	4,890	12.7	715	6.9	3,648	12.3	12,471	12.0
Science teachers also teaching mathematics	5,364	21.2	10,049	26.1	1,176	11.4	5,626	19.0	22,215	21.4

ROBERT C. HALL

Occupational plans of student borrowers under NDEA

WHEN the Congress made loan funds available to college students under the National Defense Education Act, title II, it clearly intended to encourage capable but needy young men and women to continue their education beyond the high school, particularly in fields short of trained manpower.

To make sure that its purpose would be carried out, the Congress wrote provisions into the law requiring colleges and universities to give special consideration to applications from students who have superior academic records and who express a desire to teach and to students whose academic records show superior talent in science, mathematics, engineering, or a modern foreign language.

To learn whether the loan program was in fact accomplishing the purposes of the law, the Office of Education included this question in a survey of all borrowers from the loan fund between July 1, 1960, and June 30, 1961: [1] What occupation or profession do you intend to enter? From the students' responses the Office hoped to obtain information not only on the occupational plans of the borrowers but also on the extent to which students were using loan funds for training in fields specified by the law as deserving special consideration and the extent to which they were using funds for training in other fields such as medicine or nursing.

Judging from an analysis of students' responses, colleges and universities are following the letter and the spirit of the law in making loans, and students are being trained to work in labor-shortage fields. Of an estimated 148,348 college students who borrowed from the fund between July 1, 1960, and June 30, 1961, approximately 133,000 say that a loan made it possible for them to enter or continue in college. Nearly 3 in every 5 borrowers plan to work in education as teachers, counselors, or administrators; nearly 1 in 4 plans to work in science; slightly more than 1 in 10, in engineering; and 1 in 100, in mathematics or a foreign language. Only 1 borrower in 10 plans to enter a field not requiring special consideration in making the loans, and only 1 in 100 is undecided about a career.

The tables below, summarizing the analyses of borrowers' responses, are based on a random sample of 51,444 borrowers, more than a third of the total at the time of the survey. Table 1 deals with all borrowers; tables 2 through 6, with those entitled to special consideration under the law; 7, with other borrowers.

[1] Other studies based on this survey have been reported in *Higher Education* (July 1961); *School Life* (November–December 1961); *Occupational Outlook Quarterly* (February 1962); and *Student Borrowers: Their Needs and Resources*, U.S. Government Printing Office, 1962 (OE–55011).

1. All borrowers, by occupational field they plan to enter

Occupational field of—	Total		Freshmen and sophomores		Juniors and seniors		Graduate students	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total.....	148,348	99.9	72,466	100.0	64,945	100.1	10,937	99.9
Education.....	87,640	59.1	42,239	58.3	39,736	61.2	5,665	51.8
Science.....	35,944	24.2	16,969	23.4	14,335	22.1	4,640	42.4
Mathematics.....	1,471	1.0	804	1.1	624	1.0	43	.4
Engineering.....	15,338	10.3	7,820	10.8	7,265	11.2	253	2.3
Modern foreign languages.....	290	.2	210	.3	72	.1	8	.....
Other.....	6,295	4.2	3,330	4.6	2,640	4.1	325	3.0
Undecided.....	1,370	.9	1,094	1.5	273	.4	3	.....

Since these figures are based on sample data, they are subject to sampling error. In table 1, percentage figures at 10 percent of the aggregate United States total are subject to a sampling variability of 0.5 percent; those of less than 10 percent, to a greater variability (the percentage of error is higher in all other tables).

The category "other" includes borrowers in the following fields: Religion and theology, music and art, literature and journalism, architecture, secretarial science, the armed services, speech and dramatic arts, and library science (see table 7 for details).

Percentages are not shown for less than 0.1 percent, or 12, of the borrowers.

The findings of the survey are limited to what borrowers say about their occupational plans. Although it is regrettable, it was not possible in the time available to make a survey that would answer such questions as, "Do borrowers differ significantly from nonborrowers in their occupational plans?" "To what extent are borrowers reducing the shortages of trained manpower in the fields of education, science, mathematics, engineering, and modern foreign languages?" To have obtained an answer to the first question would have required the Office to sample nonborrowers as well as borrowers in the college population. To have obtained an answer to the second would obviously have delayed the survey until after the borrowers had left college.

2. Borrowers who intend to teach and at what level

Level	Total		Freshmen and sophomores		Juniors and seniors		Graduate students	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
ALL LEVELS								
Total	86,992	100.0	42,003	100.0	39,498	100.0	5,421	100.0
Elementary	21,434	24.7	11,451	27.3	9,512	24.1	471	8.7
Secondary	55,560	63.9	27,427	65.3	25,605	64.8	2,528	46.6
College	9,928	11.4	3,125	7.4	4,381	11.1	2,422	44.7
SECONDARY								
Total	55,560	100.0	27,427	100.0	25,605	100.0	2,528	100.0
Agriculture	529	1.0	178	.7	328	1.3	23	.9
Business education	2,068	3.7	1,126	4.1	899	3.5	43	1.7
English	4,065	7.3	1,833	6.7	2,014	7.9	218	8.6
Foreign language	2,132	3.8	1,152	4.2	879	3.4	101	4.0
History	2,215	4.0	888	3.2	1,169	4.6	158	6.3
Home economics	1,528	2.8	879	3.2	632	2.5	17	.7
Industrial arts	781	1.4	278	1.0	480	1.9	23	.9
Mathematics	5,633	10.1	3,105	11.3	2,373	9.3	155	6.1
Music and art	3,672	6.6	1,905	6.9	1,609	6.3	158	6.3
Physical education	2,373	4.3	1,141	4.2	1,186	4.6	46	1.8
Science	5,499	9.9	2,663	9.7	2,623	10.2	213	8.4
Social studies	2,146	3.9	845	3.1	1,132	4.4	169	6.7
Other, not specified	22,919	41.2	11,434	41.7	10,281	40.1	1,204	47.6

These figures do not include the borrowers who plan to go into educational administration or counseling and guidance. Of the 86,992 who plan to teach, 1 in 4 will go into elementary schools, 3 in 5 into secondary schools, and 1 in 10 into colleges.

Borrowers intending to teach in secondary schools more frequently mention these subjects as their preferences: Mathematics, science, English, music, and art. More than 2 out of 3 did not choose a subject specialty from those listed on the questionnaire.

There is a marked contrast between these undergraduates and graduate students in choice of subjects they wish to teach. Fewer graduates list science, home economics, mathematics, business education, and physical education; and more list English, social studies, and history.

3. Borrowers who intend to work in the physical sciences

Physical science field	Total		Freshmen and sophomores		Juniors and seniors		Graduate students	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	4,677	100.0	2,652	100.0	1,772	100.0	253	100.0
Physics	1,626	34.8	902	34.0	655	37.0	69	27.3
Chemistry	2,146	45.9	1,330	50.2	730	41.2	86	34.0
Geology	345	7.4	75	2.8	189	10.7	81	32.0
Astronomy	40	.8	26	1.0	14	.8	.....	.....
Other	520	11.1	319	12.0	184	10.3	17	6.7

Nearly 1 in every 4 of all borrowers during the period covered plan to go into the physical sciences. Nearly 1 in 2 of those going into the physical sciences name chemistry as their occupational field. Physics, the second choice of undergraduates and the third choice of graduate borrowers, includes general physics, nuclear physics, and neophysics. Slightly more than 1 in 10 of the the borrowers in the physical sciences are included here under "other" because they listed only physical science or just science.

4. Borrowers who intend to work in biological science or related fields

Biological science field	Total		Freshmen and sophomores		Juniors and seniors		Graduate students	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	15,504	100.0	7,549	100.0	5,424	100.0	2,531	100.0
Agriculture	727	4.7	348	4.6	330	6.1	49	1.9
Biochemistry and biophysics	106	.7	54	.7	43	.8	9	.4
Biology	356	2.3	201	2.7	144	2.6	11	.4
Foods and food technology	192	1.2	77	1.0	103	1.9	12	.5
Forestry	698	4.5	336	4.5	345	6.4	17	.7
Medical science (see detail below)	11,043	71.2	5,372	71.2	3,453	63.7	2,218	87.6
Psychology (social not included)	954	6.2	371	4.9	431	7.9	152	6.0
Pharmacy	1,095	7.1	621	8.2	457	8.4	17	.7
Other	333	2.1	169	2.2	118	2.2	46	1.8
Medical science								
Total	11,043	100.0	5,372	100.0	3,453	100.0	2,218	100.0
Dentistry	2,135	19.3	793	14.8	773	22.4	569	25.7
Medicine	6,122	55.4	2,818	52.4	1,764	51.1	1,540	69.4
Medical technology	695	6.3	520	9.7	169	4.9	6	.3
Nursing	1,301	11.8	890	16.6	397	11.5	14	.6
Physical and occupational therapy	253	2.3	161	3.0	83	2.4	9	.4
Veterinary medicine	537	4.9	190	3.5	267	7.7	80	3.6

Medicine is the first choice of all the students who name biological science as their occupational field—7 in 10 of students at all levels and 9 in 10 of the graduate students (see below for details on medical fields). Pharmacy is the second choice of the undergraduates and psychology the second choice of the graduate students.

The category "other" includes some fields that could be combined with biology—for example, botany, zoology, and entomology; some fields that overlap biology—for example, genetics and forestry; and some fields that students listed only as "other biology."

The lower part of the table gives detail on the borrowers who plan on some field of medical science. The undergraduates are in premedical courses in colleges and universities and the graduate students in professional medical schools.

Medicine ranks highest among both graduate and undergraduate borrowers. More than 1 in every 2 of these borrowers plans to go into medicine; 1 in 5, dentistry; 1 in 10, nursing; 1 in 20, medical technology; and 1 in 50, physical and occupational therapy. Nursing ranks second among freshmen and sophomores and dentistry second among juniors and seniors and graduate students.

Since nursing, medical technology, physical and occupational therapy are all undergraduate courses, naturally the percentages of borrowers planning to go into these fields decrease at the higher levels.

5. Borrowers who intend to work in an engineering field

Engineering field	Total		Freshmen and sophomores		Juniors and seniors		Graduate students	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	15,338	100.0	7,820	100.0	7,265	100.0	253	99.9
Aeronautical	563	3.7	368	4.7	187	2.6	8	3.2
Chemical	1,290	8.4	744	9.5	511	7.0	35	13.8
Civil	1,873	12.2	784	10.0	1,054	14.5	35	13.8
Electrical	4,404	28.7	2,316	29.6	2,051	28.2	37	14.6
General	3,683	24.0	2,109	27.0	1,491	20.5	83	32.8
Industrial management	646	4.2	250	3.2	379	5.2	17	6.7
Mechanical	2,086	13.6	911	11.7	1,149	15.8	26	10.3
Metallurgical and mining	333	2.2	97	1.2	236	3.3	.....	.....
Other	460	3.0	241	3.1	207	2.9	12	4.7

There may be several reasons for the difference between graduate students and undergraduates in the choice of types of engineering occupations. Among them are the following: Many undergraduates may be in schools that offer no graduate courses; some engineering fields require less advanced preparation than others; and some industries that employ engineers provide for advanced training on the job.

Roughly 5 percent of the undergraduate and 6 percent of the graduate borrowers did not name a type of engineering on the survey form or named one rarely mentioned in the sample.

6. Borrowers who intend to work in social science or related fields

Social science field	Total		Freshmen and sophomores		Juniors and seniors		Graduate students	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	15,763	100.0	6,768	100.0	7,139	100.0	1,856	100.0
Business administration and accounting	7,912	50.2	3,571	52.8	4,025	56.4	316	17.0
Economics	500	3.2	164	2.4	307	4.3	29	1.6
Geography, history and home economics	241	1.5	126	1.9	100	1.4	15	.8
International relations	758	4.8	483	7.1	241	3.4	34	1.8
Political science, government, and law	4,611	29.2	1,683	24.9	1,678	23.5	1,250	67.4
Social psychology	1,040	6.6	445	6.6	463	6.5	132	7.1
Sociology and anthropology	244	1.6	106	1.5	112	1.5	26	1.4
Other	457	2.9	190	2.8	213	3.0	54	2.9

More than 1 in 2 of all the students naming the social sciences as their broad occupational field names business administration and accounting as their special field; 3 in 10 name political science, government, and law. Nine out of 10 graduate students name these three fields: Political science, government, and law; business administration and accounting; and social psychology. (Social psychology is included here rather than in table 4 because it includes social workers.)

Students who listed a particular field rarely mentioned in the sample such as industrial relations or public administration and those who listed social sciences in general are included in the "other" category.

7. Borrowers who intend to work in occupations not specified by NDEA

Other fields	Total		Freshmen and sophomores		Juniors and seniors		Graduate students	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	6,295	100.0	3,330	100.0	2,640	100.0	325	100.0
Architecture	629	10.0	307	9.2	308	11.7	14	4.3
Armed forces	514	8.2	141	4.2	370	14.0	3	.9
Library science	193	3.1	81	2.4	69	2.6	43	13.2
Literature, English, and journalism	747	11.9	425	12.8	310	11.7	12	3.7
Music/art	940	14.9	523	15.7	397	15.0	20	6.2
Religion and theology	1,982	31.5	1,075	32.3	738	28.0	169	52.0
Secretarial science	532	8.4	405	12.2	124	4.7	3	.9
Speech and dramatic arts	336	5.3	143	4.3	167	6.3	26	8.0
Miscellaneous other	422	6.7	230	6.9	157	6.0	35	10.8

These figures, giving detail on the "other" category in table 1, should give us some idea of how much the loan program is benefiting students other than those entitled by the law to special consideration. Although some of the items in this table are the same as those listed in table 2—English, for example—the figures are for different students. Those in table 2 intend to teach; those included here do not.

Three out of 10 of all borrowers not entitled to special consideration specify religion and theology as their choice of a career. However, only 1.3 percent of all borrowers in the loan program at the time of the survey specify this field.

The percentages of other borrowers planning to go into theology and religion and into music and art, the second choice, may be high because of the large number of schools in the program that are exclusively Bible and theology schools or exclusively music and art schools.

DR. HALL, who conducted the survey that uncovered the foregoing facts, is chief of the Program Analysis Section of the Student Financial Aid Branch, Office of Education. He has been with the Office since the early days of the student loan program.

Grants to train teachers of the deaf

These colleges and universities have received grants from the Federal Government under Public Law 87–276. The list shows the numbers being trained and the amounts of the grants. See Dr. Hoag's article, page 18.

University of Alabama, 6 graduate: $22,360

University of Arizona, 7 graduate, 5 undergraduate: $38,284

University of Arkansas, 15 undergraduate: $38,050

University of Southern California, Los Angeles, 6 graduate, 6 undergraduate: $44,647

Los Angeles State College, 8 graduate, 4 undergraduate: $35,124

San Francisco State College, 7 graduate, 5 undergraduate: $35,902

Colorado State College, 8 graduate, 3 undergraduate: $32,280

Gallaudet College (D.C.), 40 graduate: $94,125

Emory University (Ga.), 4 graduate: $22,620

University of Illinois, 5 graduate, 4 undergraduate: $33,328

MacMurray College (Ill.), 3 undergraduate: $9,350

DePaul University (Ill.), 3 graduate, 5 undergraduate: $32,832

Northwestern University (Ill.), 5 graduate, 5 undergraduate: $38,100

Ball State Teachers College (Ind.), 8 graduate, 7 undergraduate: $41,385

University of Kansas, 10 graduate: $35,135

Boston University (Mass.), 12 graduate: $57,947

University of Massachusetts, 5 graduate: $12,300

Smith College (Mass.), 10 graduate: $25,460

Wayne State University (Mich.), 7 graduate, 5 undergraduate: $35,177

University of Minnesota, 5 graduate, 4 undergraduate: $31,934

Fontbonne College (Mo.), 8 undergraduate: $29,960

Washington University (Mo.), 7 graduate, 15 undergraduate: $66,546

Municipal University of Omaha (Nebr.), 4 graduate, 2 undergraduate: $15,148

University of New Hampshire, 4 graduate: $22,750

Trenton State College (N.J.), 6 graduate: $24,992

Eastern New Mexico University, 8 graduate: $28,344

Teachers College, Columbia University, 22 graduate: $96,007

Syracuse University, 2 graduate, 5 undergraduate: $26,050

University of Buffalo (N.Y.), 15 graduate: $53,300

New York University, 10 graduate: $52,385

Lenoir Rhyne College (N.C.), 3 undergraduate: $5,673

State Teachers College (N. Dak.), 7 undergraduate: $23,867

University of Cincinnati (Ohio), 3 graduate, 3 undergraduate: $24,475

Kent State University (Ohio), 5 graduate, 5 undergraduate: $32,360

University of Oklahoma Medical Center, 3 graduate: $11,333

Oregon College of Education, 10 graduate: $30,080

Lewis and Clark (Oreg.), 5 graduate, 5 undergraduate: $28,850

University of Pittsburgh (Pa.), 13 graduate: $54,632

Augustana College (S. Dak.), 8 undergraduate: $23,448

University of Tennessee, 10 graduate, 4 undergraduate: $45,928

University of Texas, 5 graduate, 6 undergraduate: $35,882

University of Utah, 6 undergraduate: $19,305

University of Wisconsin, 4 graduate, 6 undergraduate: $27,583

Notes on the Notable

Changes in technical assistance program

THE CHANGING demands on the technical assistance program for the training of teachers (see *School Life*, November-December 1962, p. 8) are illustrated by two programs the Technical Training Section of the Bureau of International Education is now administering. The first is for a group of 30 Vietnamese undergraduate students. The second is for a group of 11 school administrators from the Republic of the Congo.

The Vietnamese program is for undergraduates and will lead to B.S. and B.A. degrees after about 4 years of study. Participants are young and have no work experience, having just graduated from the equivalent of a U.S. high school. In the past, most degree participants were graduate students on 1- or 2-year programs, or supervisors and specialists on programs composed of seminars, study, and observation.

The 30 participants on the current program are studying in four fields—all fields in which they cannot receive training in Vietnam—banking, botany, economics, and engineering (electrical, chemical, nuclear, and industrial chemical). On their return home they will work with ministries of their government or will join the faculties of either of Vietnam's two Government universities (University of Saigon and University of Hué). In making the request for this program to the Agency for International Development, the Government of Vietnam is looking forward to the country's political, economic, and educational growth.

The program for the Congolese demonstrates the versatility now being required in planning technical assistance programs for teachers. The Congo for many years has had numerous elementary schools, but secondary schools are practically nonexistent. The 11 participants have attained about a 7th-grade education; none has a formal background in teacher education, but most of them are supervisors of teachers. They come from rural areas and from cities; some have come to the United States under great difficulties. Their government requested a program under which they could study teaching methods, the history, organization, and philosophy of U.S. education, and ad-

ministrative and supervisory practices in elementary and secondary schools.

The 6-month program arranged for them by the Technical Training Section is "tailormade." Since none of the participants speaks English, it began with special seminars conducted in French at Baldwin-Wallace College, supplemented with numerous visits to local schools to demonstrate the topic under discussion. They are now on a 4-week program in Puerto Rico observing Operation Bootstrap and literacy education programs. They will return to Washington before going home for a communications seminar conducted by AID and for a final evaluation session with the Office.

Participants reported they are impressed with the separation of church and school, by the decentralization of education, and by the service of professional educational organizations.

Special education conferences

THE Education of Exceptional Children and Youth Branch of the Office of Education has held two productive conferences in recent weeks. In the first, staff members of the branch met with State directors of special education; in the second, with representatives of more than 20 specialized national organizations with educational programs for one or more types of exceptional children.

The first meeting was concerned primarily with three subjects: The effect of President Kennedy's panel report, a plan to combat mental retardation; the educational programs being developed by State agencies for emotionally disturbed and socially maladjusted children; and the problems of serving children with more than one complex handicap.

The second meeting was concerned with the professional preparation and standards for special educators, long-range goals, and the part that organizations might play in reaching them.

Romaine P. Mackie, chief, Exceptional Children and Youth, served as chairman of both conferences. John W. Jones, Patricia P. Robbins, and Harold M. Williams, specialists in the branch, were responsible for planning and arrangements.

Teacher development projects

Several groups of teachers from Latin America have completed or will soon complete short-term teacher development programs arranged by the Teacher Development Section of the Bureau of International Education. (See *School Life,* November–December, p. 36, for a description of the teacher development program the Office of Education administers for the Department of State.) These groups include teachers from Costa Rica, Guatemala, Mexico, and a class at the Inter-American Center of Rural Education at Rubio, Venezuela.

Costa Rica

Fifteen teachers from Costa Rica are on a special project of study in democracy and citizenship for 4 weeks at the State University of New York College of Education at Albany. They will complete their program with an educational tour which will include a visit to the United Nations headquarters and public schools in several States where citizenship courses are stressed.

Seventeen secondary rural teachers from Costa Rica are on a 30-day cultural tour, partly at their own expense. They have visited secondary schools and cultural sites in Washington, D.C., and the Washington County, Md., school system to see its closed-circuit television.

The group came prepared to sing and dance Costa Rican folk dances and have given programs at several schools.

Guatemala

Fifty social science teachers from Guatemala have completed a 25-day program on the U.S. mainland (Miami, Lexington, Pittsburgh, Philadelphia, New York, and Washington) and are now on a 4-week program at the University of Puerto Rico. They observed political activities (visiting a polling place on election day), social conditions, and citizenship classes.

Mexico

Sixteen elementary school teachers from the Escuela National de Maestro in Mexico City have completed a program in elementary school education that took them to Pittsburgh, New York City, and Boston. In Pittsburgh they attended a special seminar. In New York they visited the Bank Street College of Education, New York University (where they discussed an exchange program the university is considering), elementary schools, and high schools. In Boston they visited schools in or near the city and a college.

The group was dedicated and well prepared. They had a full program mapped out for them, but they arranged additional visits on their own. They have reported to the Office that they went home with even more information about and understanding of the United States than they had hoped to acquire.

Twenty-five faculty members from the Escuela Normal Superior have completed a 3-week program. They visited the Pan American Union in Washington for a program about the Organization of American States; the University of North Carolina for a program which included visits to nearby city and rural schools; and a seminar at the College of Education at New Paltz. They presented the University with a "tree of friendship," now planted on the campus at Chapel Hill.

Rubio group

Led by their professor, a Cuban exile, 13 rural school administrators from 11 South and Central American countries who had completed a year of academic study at the Inter-American Center of Rural Education at Rubio, Venezuela, began a program late in November. They visited rural schools near Washington and talked with school officials in positions equivalent to their own, attended seminars at the University of Pittsburgh, and visited the Catskill Area Project in New York City.

Soviet educators see school equipment and materials

A 4-MAN delegation of educators from the Soviet Union recently completed a program in the United States arranged by the Division of Technical Assistance and Exchange Programs of the Office of Education at the request of the Department of State. The four educators are Vladimir Pavlovich Strezikozin, chief

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of the program-methods administration of the Ministry of Education of the Russian Soviet Federative Socialist Republic; Aleksi Leontevich Shirokikh, director of a secondary school; Sergei Vasilyevich Chulkov, deputy chief of the educational materials production section of the Ministry of Education of the RSFSR; and Yevgeni Alekseyevich Shchegolkov, lecturer in the department of mathematical analysis of the Moscow V. I. Lenin State Pedagogical Institute.

In compliance with the request of the Soviet Government, the Office arranged a 3-week program which included visits to schools, colleges, industrial installations, and textbook publishers in Washington, Chicago, Kalamazoo, New York, and Boston. Because of the range of the request and the shortness of time, the program concentrated on as many things in one place as possible. The delegation saw examples of visual aids, classroom and laboratory equipment, school shop equipment, educational films, educational use of radio and television, textbooks, and programed instruction.

The Soviet educators reported that they were impressed with the cooperation between schools and industry in developing educational equipment and materials, and they emphasized the importance of an exchange of material between the United States and the Soviet Union.

OFFICE OF EDUCATION PUBLICATIONS CHECKLIST

FOR SALE
Order from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. Remittance must accompany order.

Earned Degrees Conferred, 1959–1960: Bachelor's and Higher Degrees.

By Wayne E. Tolliver, 1962, 207 pp., $1.50 (OE–54013–60).

Enrollment in Public and Nonpublic Elementary and Secondary Schools, 1950–80.

By Kenneth A. Simon, 1962, 12 pp., 15 cents (OE–24007).

Federal Funds for Education: Fields, Levels, Recipients, 1959 and 1960.

By Penrose B. Jackson and Dolores A. Steinhilber, 1962, 82 pp., 60 cents (OE–10013).

New Teaching Aids for the American Classroom.

A symposium on the state of research in instructional television and tutorial machines, 1962, 173 pp., $1.25 (OE–34020).

Progress in the Construction of Higher Education Facilities: Detailed Analysis, 1958–59; Trends Analysis, 1951–59.

By W. Robert Bokelman and Leslie F. Robbins, 1962, 57 pp., 40 cents (OE–51002).

Reporter: Clearinghouse of Studies on Higher Education.

By Winslow R. Hatch, Alice L. Richards, and Ann Bennet, April 1962, No. 5, 40 pp., 30 cents (OE–50004–4).

Research in Industrial Education: Summaries of Studies, 1960–61.

By Merle E. Strong (in cooperation with the Research Committee of the National Association of Industrial Teacher Educators), 1962, 34 pp., 20 cents (OE–84016–61).

Research in the Teaching of Science, July 1957–July 1959.

By Ellsworth S. Obourn, Paul E. Blackwood, and Margaret J. McKibben, 1962, 84 pp., 35 cents (OE–29000–59).

State Formulas for the Support of Public 2-Year Colleges.

By D. G. Morrison and S. V. Martorana, 1962, 30 pp., 30 cents (OE–57004).

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Educational Data: Uruguay.

By Grace I. Krumwiede, Adela R. Freeburger, and Charles C. Hauch, April 1962, 11 pp. (OE–14034–62).

Faculty and Other Professional Staff in Institutions of Higher Education, 1959–60: Summary Report.

By Felix H. I. Lindsay, December 1961, 5 pp. (OE–53014).

Fifth-Year Programs of Classroom Teacher Education: A Digest of the Survey Report.

By Henry Harap, July 1962, 10 pp. (OE–58007).

Gross Area of Non-Residential Buildings, By Facilities Category.

By E. Eugene Higgins, Mary B. Fuller, and Dorothy Jones, September 1962, 4 pp. (OE–51004–14).

A Half-Century of Salaries at Land-Grant Institutions.

By W. Robert Bokelman, Louis A. D'Amico, and Anna Jane Holbrook, October 1962, 9 pp. (OE–52004–3).

New Construction and Rehabilitation on College Campuses, 1959–60.

By W. Robert Bokelman and Leslie F. Robbins, August 1962, 10 pp. (OE–51004–15).

Opening (Fall) Enrollment in Higher Education, 1962: Institutional Data.

By Division of Educational Statistics, 1962, 35 pp. (OE–54003–62).

Projects Initiated Under Title VII, Part B, National Defense Education Act: July 1, 1958—August 31, 1962.

By the Educational Media Branch, August 31, 1962, 20 pp. (OE–34021).

The Recommendations of the 25th International Conference on Public Education.

By the Division of International Education Studies, *Information on Education Around the World*, No. 66, October 1962, 16 pp. (OE–14034–66).